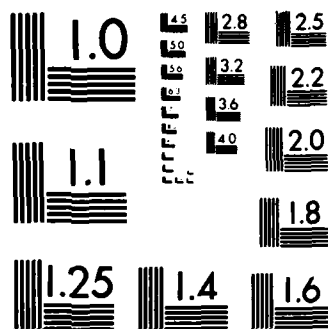


1/3

NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

12

Coso Monitoring Program

January 1981 Through December 1983

AD-A147 894

by
Steven C. Bjornstad
and
C. R. Rodgers
Public Works Department

SEPTEMBER 1984

**NAVAL WEAPONS CENTER
CHINA LAKE, CA 93555-6001**



Approved for public release;
distribution is unlimited.

DTIC
ELECTE
NOV 28 1984
B

NTIS FILE COPY

84 11 13 026

Naval Weapons Center

AN ACTIVITY OF THE NAVAL MATERIAL COMMAND

FOREWORD

This report presents the status of the Coso monitoring program conducted for calendar years 1981, 1982, and 1983 by the Naval Weapons Center (NWC), China Lake, California. The investigation, funded under the NWC Coso Geothermal Development Program, is being conducted to provide baseline information on hydrology and surface geothermal activity in the Coso Hot Springs area.

This report was reviewed for technical accuracy by J. Whelan and A. Katzenstein.

Approved by
H. H. HARRELL
Capt., CEC, U.S. Navy
Public Works Officer
5 September 1984

Under authority of
K. A. DICKERSON
Capt., U.S. Navy
Commander

Released for publication by
B. W. HAYS
Technical Director

NWC Technical Publication 6558

Published by Technical Information Department
Collation Cover, 105 leaves
First printing 155 copies

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER NWC TP 6558	2. GOVT ACCESSION NO. <i>H147894</i>	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Coso Monitoring Program, January 1981 Through December 1983		5. TYPE OF REPORT & PERIOD COVERED Summary report January 1981 - December 1983
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Steven C. Bjornstad and C. R. Rodgers		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Weapons Center China Lake, CA 93555-6001		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Weapons Center China Lake, CA 93555-6001		12. REPORT DATE September 1984
		13. NUMBER OF PAGES 208
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution is unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Coso Monitoring Program Steam Flow, Coso Hot Springs Environmental Monitoring Water Analyses Geothermal Development Water Level, Coso Hot Springs		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) See back of form.		

DD FORM 1473
1 JAN 73EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0102-LF-014-6601

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

(U) *Coso Monitoring Program, January 1981 Through December 1983*, by Steven C. Bjornstad and C. R. Rodgers. China Lake, Calif., Naval Weapons Center, September 1984. 208 pp. (NWC TP 6558, publication UNCLASSIFIED.)

(U) The Coso monitoring program is a continuing effort in support of the development of the Navy's geothermal resources within the Coso Known Geothermal Resource Area (KGRA). Data are presented on the monitoring of steam flow rates and temperatures, water levels in ponds and wells, water chemistry, temperature logs of shallow wells, and rainfall in the Coso Hot Springs Resort area. A weekly photographic essay of the mud pots and pools shows the variation of surface water levels throughout the year.

DTIC
ELECTE
NOV 28 1984

B

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

S/N 0102- LF- 014- 6601

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

CONTENTS

Introduction	5
Steam Flow Monitoring	6
Devils Kitchen Corrosion Array	6
Coso Resort Corrosion Array	10
Two-Inch Steam Well	10
Eight-Inch "Stove Pipe" Well	14
Schober's Resort	15
Coso Mud Pot Photographic Investigation	16
Water Level Monitoring	53
Coso Well 1	53
Coso Well 4P-1	56
Coso Well 2	56
Pond Levels	57
Rainfall at Coso Resort and Rose Valley	75
Water Analysis of Coso Wells	83
Temperature Logs of Coso Resort Area Wells	91
Summary and Recommendations	96
References	98
Appendixes:	
A. Daily Steam Flow Data	99
B. Daily Steam Well Temperature Data	163
C. Temperature Log Data	201
 Figures:	
1. Map of Coso Hot Springs Area Showing Monitoring Site Locations. Adapted from U.S.G.S. Haiwee Reservoir Quadrangle, 1951, 1:48,000	7
2. Devils Kitchen Corrosion Array Statistical Steam Flow Data	9

3.	Coso Resort Corrosion Array Statistical Steam Flow Data	12
4.	Two-Inch Well Statistical Steam Flow Data	13
5.	Coso Mud Pots 5 January 1981	17
6.	Coso Mud Pots 2 February 1981	18
7.	Coso Mud Pots 16 March 1981	19
8.	Coso Mud Pots 6 April 1981	20
9.	Coso Mud Pots 11 May 1981	21
10.	Coso Mud Pots 2 June 1981	22
11.	Coso Mud Pots 6 July 1981	23
12.	Coso Mud Pots 3 August 1981	24
13.	Coso Mud Pots 8 September 1981	25
14.	Coso Mud Pots 5 October 1981	26
15.	Coso Mud Pots 2 November 1981	27
16.	Coso Mud Pots 7 December 1981	28
17.	Coso Mud Pots 4 January 1982	29
18.	Coso Mud Pots 8 February 1982	30
19.	Coso Mud Pots 1 March 1982	31
20.	Coso Mud Pots 5 April 1982	32
21.	Coso Mud Pots 3 May 1982	33
22.	Coso Mud Pots 1 June 1982	34
23.	Coso Mud Pots 6 July 1982	35
24.	Coso Mud Pots 2 August 1982	36
25.	Coso Mud Pots 8 September 1982	37
26.	Coso Mud Pots 12 October 1982	38
27.	Coso Mud Pots 2 November 1982	39
28.	Coso Mud Pots 6 December 1982	40
29.	Coso Mud Pots 3 January 1983	41
30.	Coso Mud Pots 7 February 1983	42
31.	Coso Mud Pots 16 March 1983	43
32.	Coso Mud Pots 4 April 1983	44
33.	Coso Mud Pots 2 May 1983	45
34.	Coso Mud Pots 6 June 1983	46
35.	Coso Mud Pots 5 July 1983	47
36.	Coso Mud Pots 1 August 1983	48
37.	Coso Mud Pots 6 September 1983	49
38.	Coso Mud Pots 2 October 1983	50
39.	Coso Mud Pots 7 November 1983	51
40.	Coso Mud Pots 5 December 1983	52
41.	Water Levels of Coso Observation Wells, Coso Well 1 and 4P-1, 1981	54
42.	Water Levels of Coso Observation Wells, Coso Well 1 and 4P-1, 1982	55
43.	Water Levels of Coso Observation Wells, Coso Well 1 and 4P-1, 1983	55
44.	Comparison of Coso Pond Levels With Annual Rainfall and Ambient Temperature, 1981	72
45.	Comparison of Coso Pond Levels With Annual Rainfall and Ambient Temperature, 1982	73

46.	Comparison of Coso Pond Levels With Annual Rainfall and Ambient Temperature, 1983	74
47.	Rainfall Monitoring Station Locations	76
48.	Ternary Diagram of Well Fluids in a Calcium-Sodium/ Potassium-Magnesium System	89
49.	Ternary Diagram of Well Fluids in a Sulfate-Carbonate/ Bicarbonate-Chloride System	90
50.	Temperature Log Versus Depth, Coso Well 1	93
51.	Temperature Log Versus Depth, Well 4K-1	94
52.	Temperature Log Versus Depth, Well 4P-1	95

Tables:

1.	Devils Kitchen Corrosion Array Statistical Flow Data, Pounds per Hour (pph)	8
2.	Coso Corrosion Array Statistical Flow Data, Pounds per Hour (pph)	11
3.	Coso No. 2, Two-Inch Steam Well Statistical Flow Data, Pounds per Hour (pph)	13
4.	Coso No. 2, Two-Inch Well Statistical Temperature Data, °C	14
5.	Eight-Inch Well Statistical Flow Data, Pounds per Hour (pph)	15
6.	Schober's Resort Steam Well Statistical Flow Data in Pounds per Hour (pph)	16
7.	Water Level Reading for Coso Well No. 2	56
8.	Elevation Data on Coso Pools, 1981	58
9.	Elevation Data on Coso Pools, 1982	62
10.	Elevation Data on Coso Pools, 1983	67
11.	Summary of Water Level, in Feet, at South Pool, 1980-83	75
12.	Inches of Rainfall Recorded at Coso Monitoring Stations, 1981	77
13.	Inches of Rainfall Recorded at Coso Monitoring Stations, 1982	78
14.	Inches of Rainfall Recorded at Coso Monitoring Stations, 1983	79
15.	1981 Cumulative Rainfall, in.	80
16.	1982 Cumulative Rainfall, in.	81
17.	1983 Cumulative Rainfall, in.	82
18.	Chemical Analysis of Coso Well 1	84
19.	Chemical Analysis of Well 4P-1	85
20.	Chemical Analysis of Well 4K-1	86
21.	Chemical Analysis of Coso Well 2	87
22.	Comparison of Electrical Balances in Wells	88
23.	Geothermometric Determinations From the Water Chemistry of the Observation Wells	92

INTRODUCTION

The project to monitor surface and near-surface geothermal activity at Coso Hot Springs and Devils Kitchen, the major thermal sites within the historic and cultural properties of the Coso Known Geothermal Resource Area (KGRA), was initiated in 1978 in response to the Naval Weapons Center (NWC) concerns over the possible adverse effects on this geothermal activity by the development of the Navy's geothermal resource.

The initial project, Reference 1, included monitoring of steam flow rates at the Devils Kitchen and Coso Corrosion Arrays, water level at Coso Well 1, and a photographic study of the Coso Mud Pots.

By late 1979 the initial monitoring effort had been incorporated by Dr. James Whelan and C. R. Rodgers, both of the Geothermal Utilization Division at NWC, into a comprehensive program to establish baseline data on these geothermal activities. The program monitors steam flow rates and temperatures, mud pot levels and temperatures, water levels and water chemistry in wells and pools, and rainfall and other local climatic variables (Reference 2). The monitoring program continues in this form today with minor modifications, made primarily to improve the reliability of the data-collecting devices.

On 26 December 1979 the formal justification for this monitoring program was included in the "Programatic Memorandum of Agreement" between the Commander, NWC, and the California State Historic Preservation Officer, Advisory Council On Historic Preservation (Reference 3). Under the heading "Historic and Cultural Resources Management Program," subheading "Historic and Cultural Property Management," the Commander, NWC, agreed that he would "implement the proposed undertaking [geothermal resource development] in accordance with the following process to avoid or satisfactorily mitigate any adverse effects on significant historic or cultural property [i.e., Coso Hot Springs]." Section 6.e. of the "process" states, in part:

The Commander, Naval Weapons Center, will establish baseline data on the seasonal activity of some 40 steam wells and boiling mud pits at Coso Hot Springs sufficient to permit systematic monitoring for any effect that may be caused over time by the geothermal development program.

The monitoring program in its present form is intended to meet this requirement.

Additional monitoring tasks have been suggested, such as modification of existing spring discharge features to channel all major discharge to a centralized discharge point; establishment of an on-site continuously recording climatological station; and drilling a shallow observation well in the alluvium to the west of the hot springs to measure the shallow aquifer (References 4 and 5). Each of the suggestions has merit; however, within the constraints imposed by both the restrictions of the National Historic Site and the law of diminishing returns, it is felt that these additional measures are unnecessary and that the present baseline data collection program adequately fulfills the Navy's responsibility with regard to Section 6.e. of the agreement.

This report presents the results of this continuing baseline data collection program for the calendar years 1981, 1982, and 1983. While the authors have done much of the data reduction and analysis, most of the weekly data were collected and the photographs taken by E. M. Edwards of the Geothermal Utilization Division. Additional data posting and reduction was done by numerous "volunteers" in the Division, and Dr. J. Whelan provided some needed expertise in the analysis of the geochemical data.

Figure 1 is a map of the Coso Hot Springs area and shows the various monitoring sites referred to in this report. The letters that follow the site descriptions on the map indicate the monitoring functions: (a) continuous steam flow, (b) periodic steam flow, (c) continuous water level, (d) periodic water level, (e) continuous temperature, (f) periodic temperature, (g) photographic investigation of water level, and (h) water chemistry.

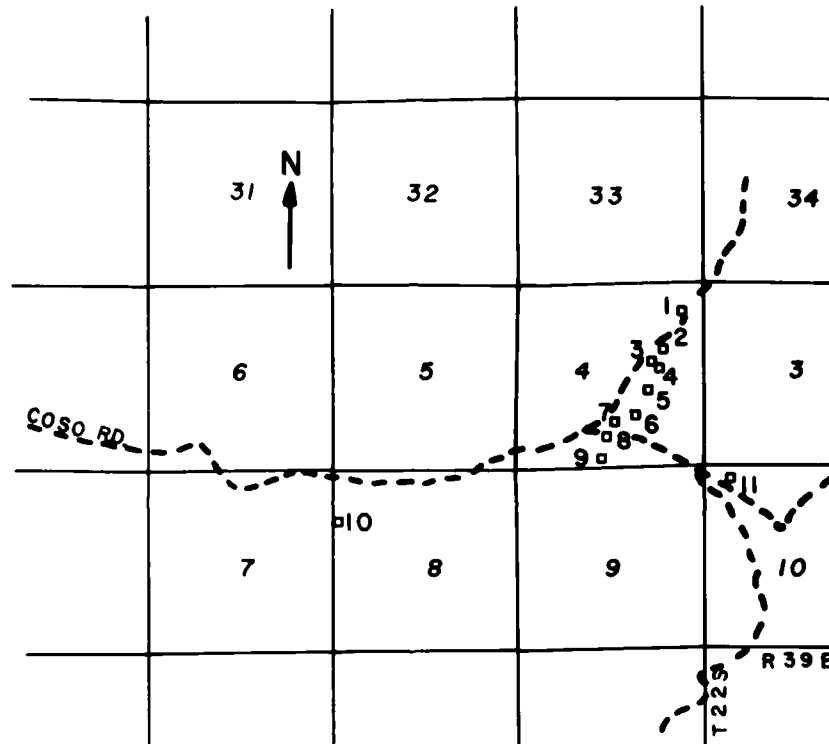
STEAM FLOW MONITORING

DEVILS KITCHEN CORROSION ARRAY

Steam flow monitoring of the Devils Kitchen corrosion array began in February 1978 in conjunction with the geothermal corrosion program. Monitoring has continued from fiscal year 1979 under the Coso environmental monitoring program.

The steam flow at the Devils Kitchen site is recorded on a clock-operated, Barton flow recorder equipped with a 25-inch water column differential pressure unit in combination with an orifice meter. The orifice diameter is 1.387 inches, resulting in a flow meter calibration factor of 40.23. The product of calibration factor and chart value is

steam flow in pounds per hour (pph). The instrument was recalibrated by the Barton representative in January 1980 and a new orifice meter installed. Corrosion effects on the orifice size since installation have been minimal. The orifices at each steam flow site were inspected and checked with a vernier caliper during January 1984. The orifices were relatively clean and showed no significant corrosion or erosion. They should not need to be checked again for 2 or 3 years.



1. Schober's Resort.....a, b, e
2. Eight-Inch Steam Well.....a, b
3. Coso Well 1.....c, f, h
4. Coso Corrosion Array.....a
5. Coso Mud Pots.....d, g
6. South Pool.....c, f, g
7. Well 4K-1.....d, f, h
8. Well 4P-1.....c, f, h
9. Two-Inch Steam Well.....a, e
10. Devils Kitchen Corrosion Array.....a
11. Coso Well 2.....d, f, h

FIGURE 1. Map of Coso Hot Springs Area Showing Monitoring Site Locations. Adapted from U.S.G.S. Haiwee Reservoir Quadrangle, 1951, 1:48,000.

The flow rate is dependent on the amount of steam that enters a 55-gallon barrel collector and on the amount that condenses in the flow line before passing through the orifice meter. The quantity of steam condensing is dependent on both steam and ambient temperatures, and the convection coefficients for the steam line. Seasonal changes in the amount of steam condensate are not significant at this site, however.

Yearly mean data and standard deviations for the high and low daily steam flows at Devils Kitchen are given in Table 1. High and low daily fluctuations are observed on all the steam flow monitoring sites at Coso and are caused primarily by ambient temperature changes during a 24-hour period. The Devils Kitchen site is much less affected than are the Coso sites by these temperature changes.

TABLE 1. Devils Kitchen Corrosion Array Statistical Flow Data, Pounds per Hour (pph).

Year	Mean, high daily flow, pph	Standard deviation, high daily flow, pph	Mean, low daily flow, pph	Standard deviation, low daily flow, pph
1983	361.8	4.1	353.3	4.2
1982	356.9	5.5	350.1	4.4
1981	356.1	4.2	348.8	5.9
1980 ^a	363.7	4.2	356.0	4.2
1979 ^a	366.9	3.7	360.0	3.7
1978 ^a	371.8	5.3	364.1	5.3

^aSource: Naval Weapons Center, *Coso Monitoring Program, January Through December 1980*, by C. R. Rodgers, E. M. Edwards, and D. L. Bowles. China Lake, Calif., NWC, December 1981. (NWC TP 6314, publication UNCLASSIFIED.)

Daily steam flows are compared for each month for calendar years 1981, 1982, and 1983 in Appendix Table A-1. Monthly mean flows are shown as well as daily mean flows for the 3-year period.

The data in Table 1 are shown graphically in Figure 2. The trend, which showed a definite small decrease in flow from 1978 through 1980 (as reported in Reference 2), continued through 1981. It was thought that the decrease may have been caused by deterioration in the drum collector, but the trend reversed itself during 1982 and 1983 and it now appears that this magnitude of fluctuation is natural for the site.

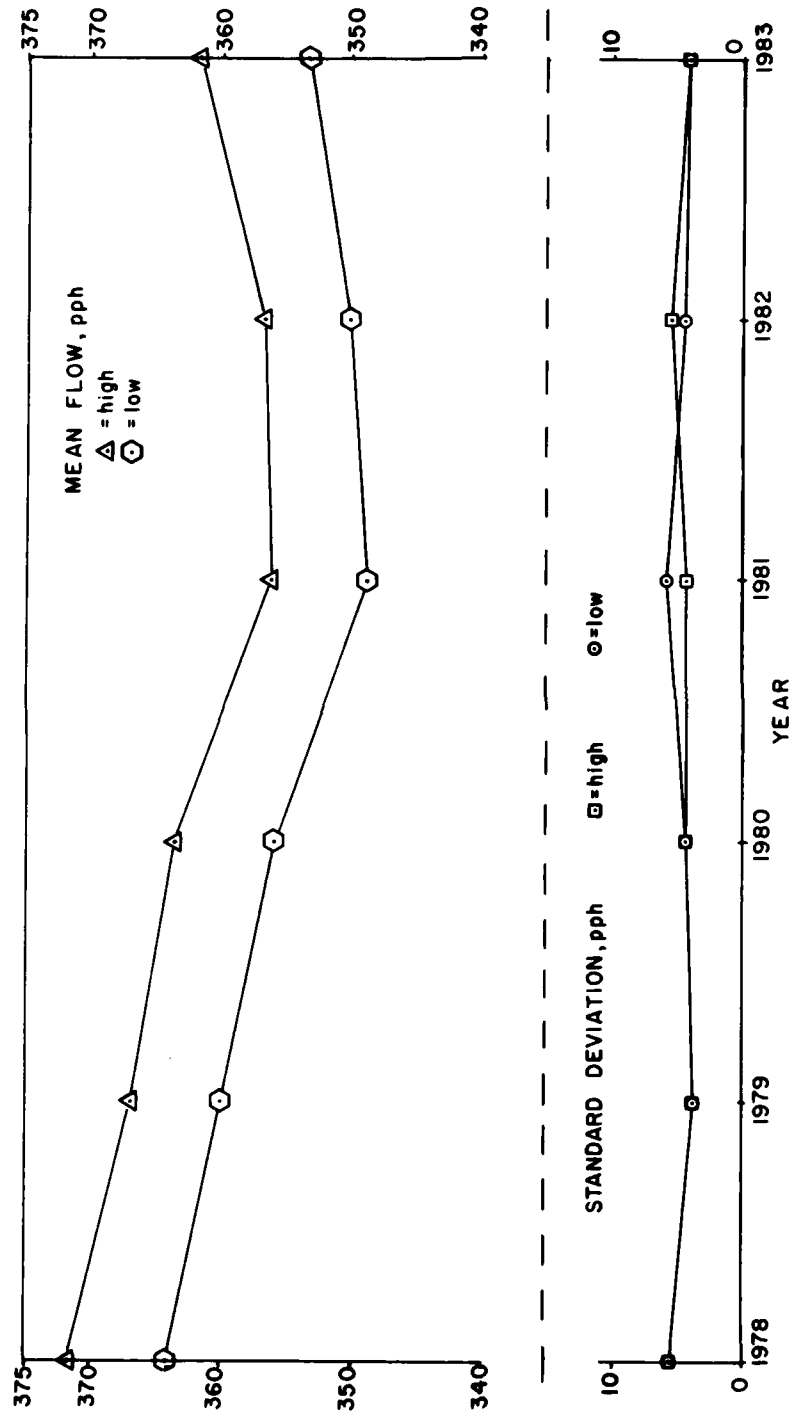


FIGURE 2. Devils Kitchen Corrosion Array Statistical Steam Flow Data.

The Devils Kitchen monitoring site continues to be the most consistent of the steam flows being monitored at Coso.

COSO RESORT CORROSION ARRAY

The monitoring site near the Coso Resort, installed in February 1978, meters the flow from four shallow steam wells through a 50-inch water column differential pressure recorder and 1.97-inch-diameter orifice plate combination resulting in a calibration factor of 120.00. Variation in flow has been greater at this site than at Devils Kitchen because of the longer steam flow lines and greater exposure to wind and ambient temperature variations, which tend to condense a larger fraction of the steam flow.

An examination of the monthly statistical data (Appendix Table A-2) indicates that piping insulation, which was added in September 1982, has not had a significant stabilizing effect on the steam flow, indicating that the fluctuation may be natural. Another factor that points to a large, natural variability of the flow is that the large spikes and dips in the monthly means are not accompanied by anomalous standard deviations (except for September 1981). This tends to indicate a smooth natural rise and fall in the flow rate. There may be a seasonal component to the fluctuations, but this is not shown conclusively by the data.

The corrosion array is downstream of the recorder and consists of a manifold with ten valves that lead to trays on which test materials are set (Reference 6). If several valves are closed, a back pressure may result that may affect the flow recorder. The valves are not checked regularly, but they have occasionally been found closed. Since no corrosion studies are presently in progress, we should ensure that the valves be kept open. This last known artificial influence on the steam flow reading probably needs to be eliminated before we can be certain that the flow rate fluctuations are natural.

Daily steam flows are compared for each month for calendar years 1981, 1982, and 1983 in Appendix Table A-3. Monthly mean flows are shown as well as daily mean flows for the 3-year period.

Yearly mean data and standard deviations for the high and low daily steam flows at the Coso Corrosion Array are listed in Table 2 and shown graphically in Figure 3.

TWO-INCH STEAM WELL

The 2-inch well (site 9 in Figure 1) is located on the south end of the Coso Fault. It is designated as Coso No. 2 on the recorder charts. This site is monitored for both steam flow and steam temperature with

the data being recorded on a Barton two-pen recorder. The steam flow is measured in the stand pipe at the wellhead with a 25-inch water column differential pressure unit in combination with an orifice meter. The orifice diameter is 0.86 inch, which results in a calibration factor of 15.7.

TABLE 2. Coso Corrosion Array Statistical Flow Data, Pounds per Hour (pph).

Year	Mean, high daily flow, pph	Standard deviation, high daily flow, pph	Mean, low daily flow, pph	Standard deviation, low daily flow, pph
1983	691.1	56.8	626.1	46.7
1982	753.6	26.3	685.7	24.4
1981	751.3	93.8	690.9	97.2
1980 ^a	715.2	37.2	666.0	31.6
1979 ^a	710.4	74.4	679.2	69.6
1978 ^a	621.6	56.4	585.6	57.6

^aSource: Naval Weapons Center. *Coso Monitoring Program, January Through December 1980*, by C. R. Rodgers, E. M. Edwards, and D. L. Bowles. China Lake, Calif., NWC, December 1981. (NWC TP 6314, publication UNCLASSIFIED.)

Daily steam flows and temperatures are compared for each month for calendar years 1981, 1982, and 1983 in Appendix Tables A-4 and B-1, respectively. The yearly mean data and standard deviations for the high and low daily steam flows at the 2-inch well are listed in Table 3 and shown graphically in Figure 4.

Beginning in 1981 the monthly average steam flows dropped from the 1980 levels and were not regained until mid-1983. Using the monthly average daily high flows, we find that the rate began to drop in August 1980 (from a high of 145.2 pph in July) to a low of 121.3 pph in January 1981. From that point the rate shows seasonal influences through 1981, with high flow in the summer and lower flow in the winter. Beginning in December 1981 these seasonal variations have become much less pronounced and are overshadowed by an upswing in the last six months of 1982 that exceeded the 1980 high. The daily high flow rate leveled off in the 148- to 150-pph range for September through December 1983.

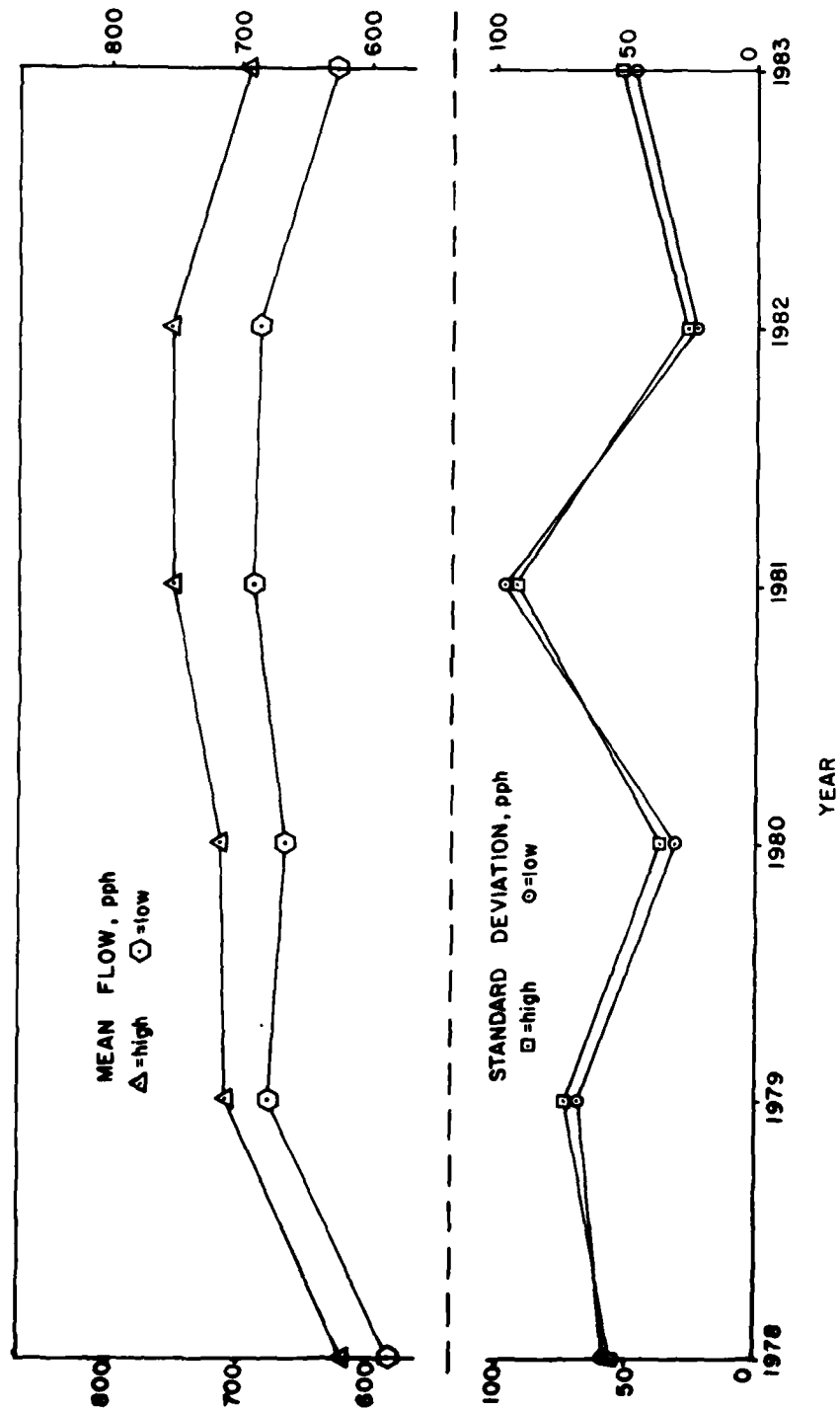


FIGURE 3. Coso Resort Corrosion Array Statistical Steam Flow Data.

TABLE 3. Coso No. 2, Two-Inch Steam Well Statistical Flow Data, Pounds per Hour (pph).

Year	Mean, high daily flow, pph	Standard deviation, high daily flow, pph	Mean, low daily flow, pph	Standard deviation, low daily flow, pph
1983	140.4	8.7	107.4	11.6
1982	127.8	9.1	111.4	7.4
1981	125.7	5.5	110.0	7.4
1980 ^a	139.6	7.7	126.0	5.3

^aSource: Naval Weapons Center. *Coso Monitoring Program, January Through December 1980*, by C. R. Rodgers, E. M. Edwards, and D. L. Bowles. China Lake, Calif., NWC, December 1981. (NWC TP 6314, publication UNCLASSIFIED.)

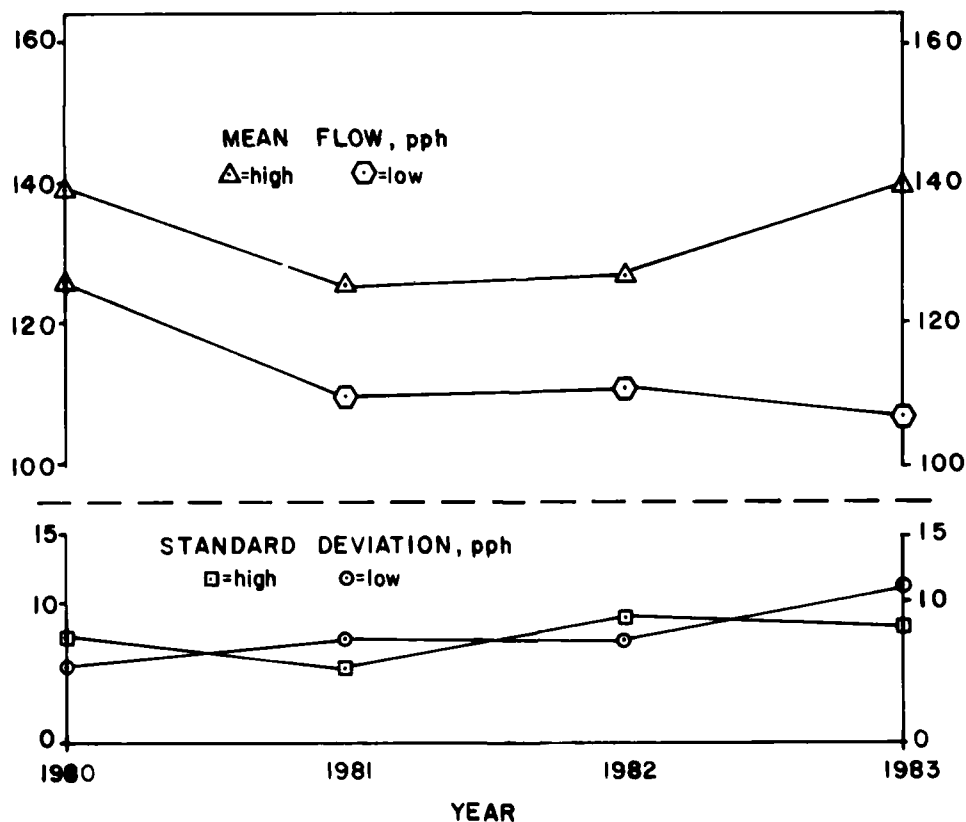


FIGURE 4. Two-Inch Well Statistical Steam Flow Data.

Table 4 gives the yearly statistical analysis of the steam temperature data. The steam temperature records for the three years show diurnal and seasonal variations as expected. The temperature range remains consistent, although the daily lows are much more variable than the daily highs. No other trends have been identified.

TABLE 4. Coso No. 2, Two-Inch Well Statistical Temperature Data, °C.

Year	Mean, daily high	Standard Deviation	Mean, daily low	Standard Deviation
1983	208.1	5.1	195.4	10.4
1982	206.8	4.8	194.6	16.2
1981	206.6	3.3	194.3	8.5
1980	208.0	4.0	191.3	9.1

EIGHT-INCH "STOVE PIPE" WELL

This well was dug and cased with a string of 55-gallon barrels to a depth of at least 20 feet prior to the Navy acquiring the land. The well was rehabilitated and capped with an eight-inch "stove pipe" by Navy personnel specifically for use as a steam monitoring site. In March 1981 instrumentation for continuous steam flow monitoring was installed at this site. The Barton flow recorder is equipped with a 10-inch water column differential pressure unit in combination with an orifice meter. This unit was originally equipped with a 25-inch water column, but low steam flows necessitated the change in November 1982. The orifice diameter is 1.25 inches, resulting in a calibration factor of 20.57.

The steam flow measurements at this site have not been very reliable, in part because of condensation blockage in the meter lines. At times this blockage actually reversed the pressure head and gave negative readings on the instrument. The blockage was probably caused by condensation of the low temperature steam above the orifice plate causing water (condensate) to drain into the low-pressure side of the differential pressure lead. Steps were taken to correct this situation, but the current results have not been totally satisfactory. The collector and emissions piping were insulated (March 1982), and the leads to the differential pressure unit were reconfigured to reduce condensate drainage (November 1983). These changes appear to have resulted in an improvement in the data collection, but several months' data will be needed before a firm trend can be identified. Table 5 lists the 1981, 1982, and 1983 statistical data from this site, while the daily high and low data are given in Appendix Table A-5.

TABLE 5. Eight-Inch Well Statistical Flow Data, Pounds per Hour (pph).

Year	Mean, high daily flow, pph	Standard deviation, high daily flow, pph	Mean, low daily flow, pph	Standard deviation, low daily flow, pph
1983	129.5	42.0	114.7	49.8
1982 ^a	205.0	97.2	174.9	97.7
1981	257.0	69.1	176.3	90.3

^aUnreliable data.

SCHOBER'S RESORT

Instrumentation for continuous flow monitoring at this site was installed in January 1981. Steam flow and temperature are measured from a single 2-inch well with Barton recorders. The original flow recorder was a 25-inch water column differential pressure unit recorder in combination with an orifice meter with a 1.2-inch-diameter orifice. Chart readings are multiplied by a calibration factor of 0.8316 to convert to pounds per hour. A second recorder is used to continuously record both steam and ambient temperatures.

As with the Eight-Inch "Stove Pipe" Well, flow measurements at this site have not been reliable because of the low temperature and low flow rate of the steam. This problem, coupled with the original configuration of the piping, resulted in condensation blockage in the meter lines and led to erroneous readings.

Good flow data were obtained for six months in 1981 with the recorder but by mid-July the data became unreliable and remained unreliable until the orifice meter was repiped late in December 1982. A new 10-inch water column differential pressure recorder was also installed resulting in a calibration factor of 0.5265 for this site from January 1983 forward.

The 1983 flow data are in good agreement with manometer data that are recorded manually each week and provide a check on the accuracy of the recorder.

Daily steam flows are compared in Appendix Table A-6 for each month of 1983 and also for the first 6 months of 1981. Monthly mean flows are also shown. Yearly mean data and standard deviations for the high and low daily steam flows at Schober's Resort area are given in Table 6. As evidenced in the monthly means for the daily high and low flows, there was a continuous increase in the flow rate from January through September

after which the rate steadily declined through December. Appendix Table A-7 shows the manometer readings and corresponding flow rates recorded manually in 1983. Flow is calculated by multiplying the flow factor $1.0446 \times \sqrt{\text{cm H}_2\text{O}}$ as read on the manometer.

TABLE 6. Schober's Resort Steam Well Statistical Flow Data in Pounds per Hour (pph).

Year	Mean, high daily flow, pph	Standard deviation, high daily flow, pph	Mean, low daily flow, pph	Standard deviation, low daily flow, pph
1983	4.69	0.42	4.27	0.43
1982 ^a	4.70	...	...	...
1981 ^b	4.41	0.80	3.81	0.78

^aData from a limited number of manometer readings.

^bRepresents flow meter data from January through June 1981.

Appendix B-2 is a listing of the daily high steam temperature versus the daily high ambient temperature recorded at Schober's Resort. The daily high steam temperature generally stays within a range of about 120 to 135°F. While day-to-day changes can be as much as 20°F, the mean day-to-day change is about 2°F. All of the variation of the daily high steam temperature appears to be independent of the ambient temperature.

COSO MUD POT PHOTOGRAPHIC INVESTIGATION

A weekly photographic investigation was initiated in January 1978 to document the fluctuation in fluid levels in several of the more prominent mud pots at Coso and will continue into the production and power-generation stages of the geothermal development. This qualitative effort, coupled with the quantitative fluid level monitoring program, will provide the baseline data required to gauge any effects of geothermal production within the Coso KGRA on the state of geothermal activity at the Coso Hot Springs.

Figures 5 through 40 illustrate the seasonal variations in the fluid levels of four of the Coso mud pots. The complete weekly photographic series is maintained by the Geothermal Utilization Division, NWC.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 5. Coso Mud Pots 5 January 1981.



(A) SOUTH POOL.



(B) GRAY MUD POTS.



(C) RED AND GRAY POOL.



(D) BROWN MUD POTS.

FIGURE 6. Coso Mud Pots 2 February 1981.



(A) SOUTH POOL.



(B) GRAY MUD POTS.



(C) RED AND GRAY POOL.



(D) BROWN MUD POTS.

FIGURE 7. Coso Mud Pots 16 March 1981.



(A) SOUTH POOL.



(B) GRAY MUD POTS.



(C) RED AND GRAY POOL.



(D) BROWN MUD POTS.

FIGURE 8. Coso Mud Pots 6 April 1981.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 9. Coso Mud Pots 11 May 1981.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 10. Coso Mud Pots 2 June 1981.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 11. Coso Mud Pots 6 July 1981.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 12. Coso Mud Pots 3 August 1981.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 13. Coso Mud Pots 8 September 1981.



(A) SOUTH POOL.



(B) GRAY MUD POTS.



(C) RED AND GRAY POOL.



(D) BROWN MUD POTS.

FIGURE 14. Coso Mud Pots 5 October 1981.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.

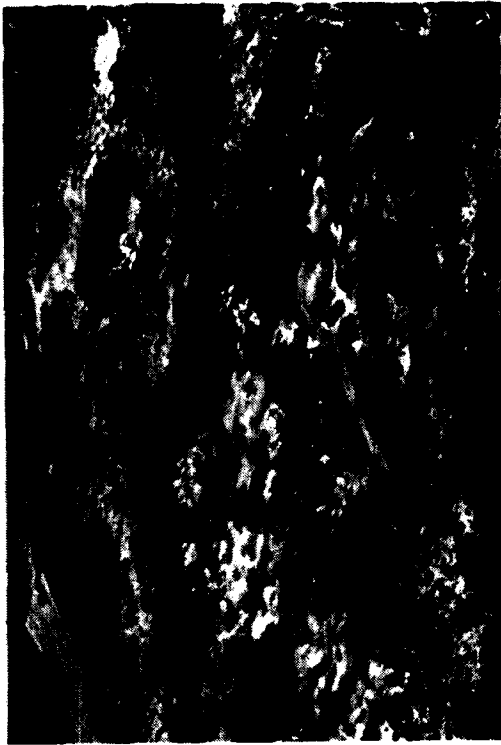


(C) RED AND GRAY POOL.

FIGURE 15. Coso Mud Pots 2 November 1981.



(A) SOUTH POOL.



(B) GRAY MUD POTS.



(C) RED AND GRAY POOL.



(D) BROWN MUD POTS.

FIGURE 16. Coso Mud Pots 7 December 1981.



(A) SOUTH POOL.



(B) GRAY MUD POTS.



(C) RED AND GRAY POOL.



(D) BROWN MUD POTS.

FIGURE 17. Coso Mud Pots 4 January 1982.



(A) SOUTH POOL.



(B) GRAY MUD POTS.



(C) RED AND GRAY POOL.



(D) BROWN MUD POTS.

FIGURE 18. Coso Mud Pots 8 February 1982.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 19. Coso Mud Pots 1 March 1982.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 20. Coso Mud Pots 5 April 1982.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 21. Coso Mud Pots 3 May 1982.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 22. Coso Mud Pots 1 June 1982.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 23. Coso Mud Pots 6 July 1982.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 24. Coso Mud Pots 2 August 1982.



(A) SOUTH POOL.



(B) GRAY MUD POTS.



(C) RED AND GRAY POOL.



(D) BROWN MUD POTS.

FIGURE 25. Coso Mud Pots 8 September 1982.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 26. Coso Mud Pots 12 October 1982.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 27. Coso Mud Pots 2 November 1982.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 28. Coso Mud Pots 6 December 1982.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 29. Coso Mud Pots 3 January 1983.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 30. Coso Mud Pots 7 February 1983.



(A) SOUTH POOL.



(B) GRAY MUD POTS.



(C) RED AND GRAY POOL.



(D) BROWN MUD POTS.

FIGURE 31. Coso Mud Pots 16 March 1983.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.

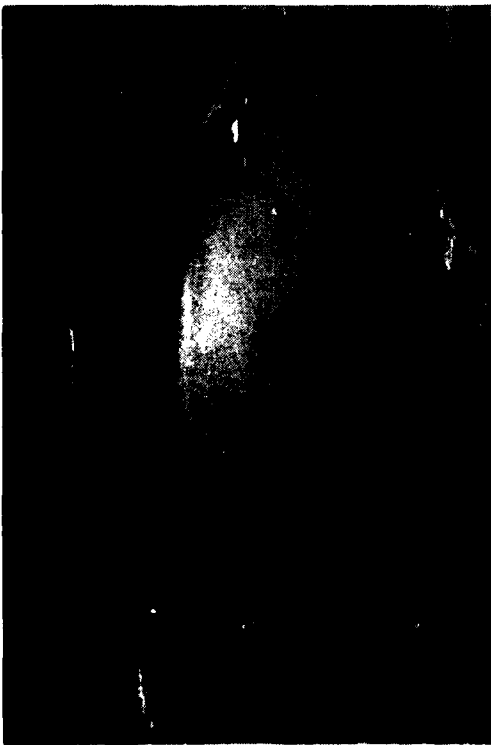


(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 32. Coso Mud Pots 4 April 1983.



(A) SOUTH POOL.



(B) GRAY MUD POTS.



(C) RED AND GRAY POOL.



(D) BROWN MUD POTS.

FIGURE 33. Coso Mud Pots 2 May 1983.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 34. Coso Mud Pots 6 June 1983.



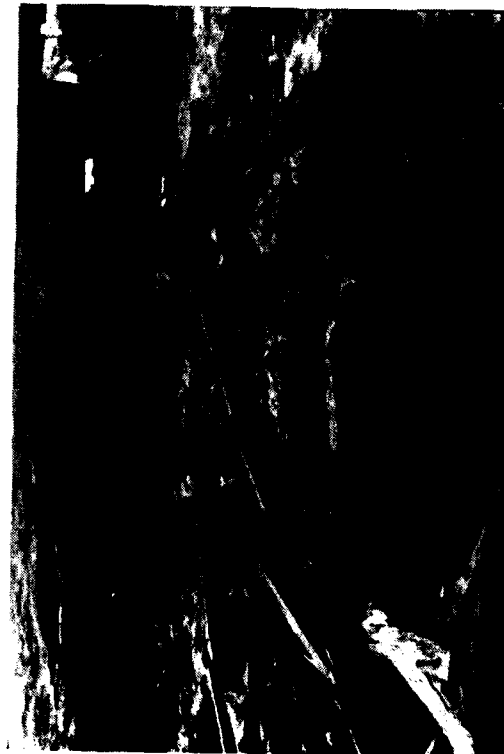
(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 35. Coso Mud Pots 5 July 1983.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.

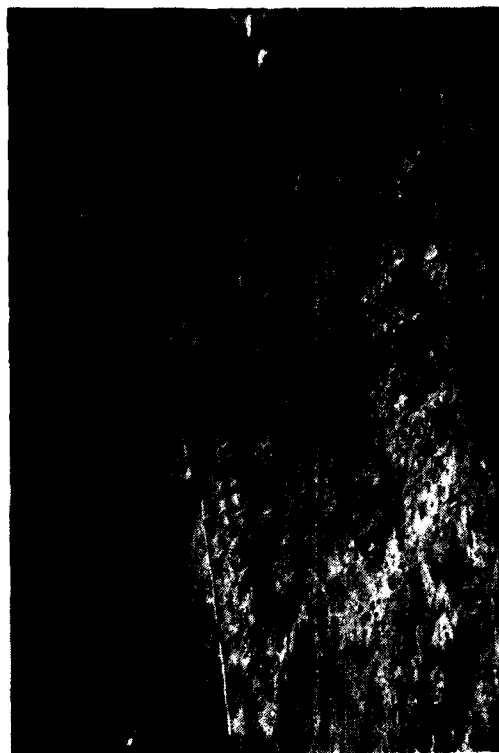


(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 36. Coso Mud Pots 1 August 1983.



(A) SOUTH POOL.



(B) GRAY MUD POTS.



(C) RED AND GRAY POOL.



(D) BROWN MUD POTS.

FIGURE 37. Coso Mud Pots 6 September 1983.



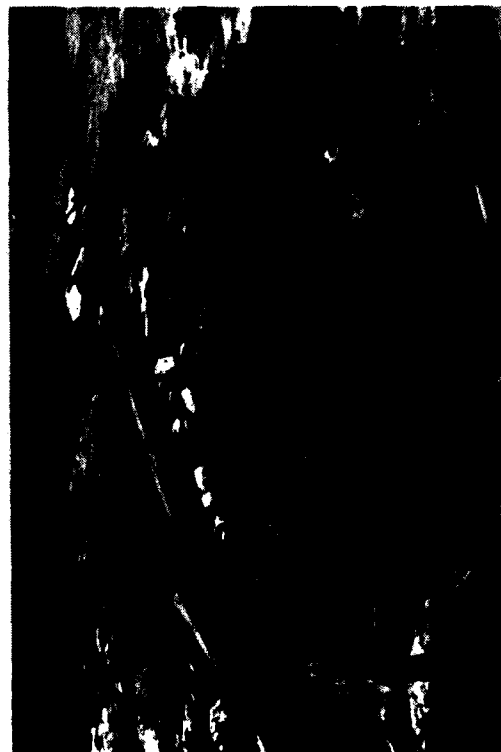
(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 38. Coso Mud Pots 2 October 1983.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 39. Coso Mud Pots 7 November 1983.



(B) GRAY MUD POTS.



(D) BROWN MUD POTS.



(A) SOUTH POOL.



(C) RED AND GRAY POOL.

FIGURE 40. Coso Mud Pots 5 December 1983.

Three of the mud pots included in the photographic series are located in the fenced compound to the south of and adjacent to the main Coso Resort building. The red and gray pool is only one pool when it is more than half full of water but separates into two pools as the water level drops below half full. As boiling subsides, the two pools occasionally take on two distinct colors, one red and the other gray. This pool is approximately 8 to 10 inches deep when full. Appendix Table B-3 is a listing of mud pot daily high temperatures versus ambient daily high temperatures at the mud pots site. The ambient temperatures appear high, and the thermoreceptor may need calibration.

Two of the mud pots in the photographic series, the gray mud pot and the brown mud pot, are located about 4 feet to the west of the red and gray pool. The depth of these two mud pots is about 4 to 6 inches, and, like the red and gray pool, they exhibit a low level of boiling activity.

The largest pool at Coso is the South Pool (also known as the mud pool). It is located inside a circular excavation along the Airport Lake-Coso Hot Springs fault scarp, approximately 1000 feet south of the main resort area. The pool is roughly circular, and when full, it covers an area about 40 feet in diameter. The pool has a maximum depth of 8 to 10 feet although much of it is shallower than 3 feet. Several other steam vents (besides those under the pool) are also present inside the excavation. These vents are connected hydrologically and contain water only when the water level is high enough.

WATER LEVEL MONITORING

Water levels are monitored in three Coso wells and three pools. Two of the wells are monitored with continuous float-activated water-level recorders, while most of the pools are monitored manually. In December 1980 a recorder was installed on the south pool. A third well, Coso Well 2, is measured at irregular intervals by means of an air-line displacement method.

Coso Well 1

The manually gauged depth of the water in Coso Well 1 is 140 ± 1 feet with frequent, very fast heaves of 3 to 4 feet. These heaves may be the result of a large gas bubble (steam and CO_2) formation and expansion caused by pressure buildup in the subsurface.

Monitoring the water level in Coso Well 1 with the water-level recorder presented problems that were not anticipated when the recorder was installed. A heavily weighted float is necessary to prevent its being violently thrown up the well bore and entangling the support line 5 to 10 feet above the water surface. The weighted float, with near-neutral buoyancy, is being thrown 3 to 4 feet up the bore and then falls back below the water surface. The result is that the recorder data are unreliable, and the data reported for the water level in this well are periodic calibration readings that are etched on the instrument-actuating tape and marked manually on the recorder chart. Continued efforts to overcome the gassing problem have proved unsuccessful. Water depths of Coso Well 1 and Well 4P-1 are plotted in Figures 41 through 43 from readings taken weekly and recorded manually.

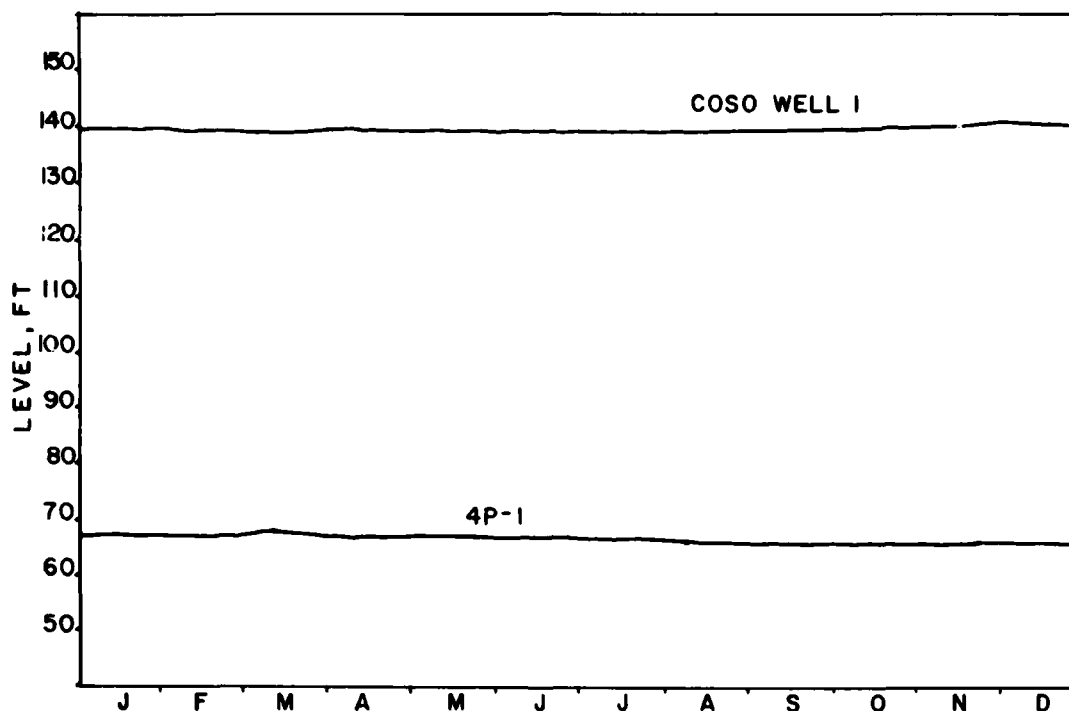


FIGURE 41. Water Levels of Coso Observation Wells, Coso Well 1 and 4P-1, 1981.

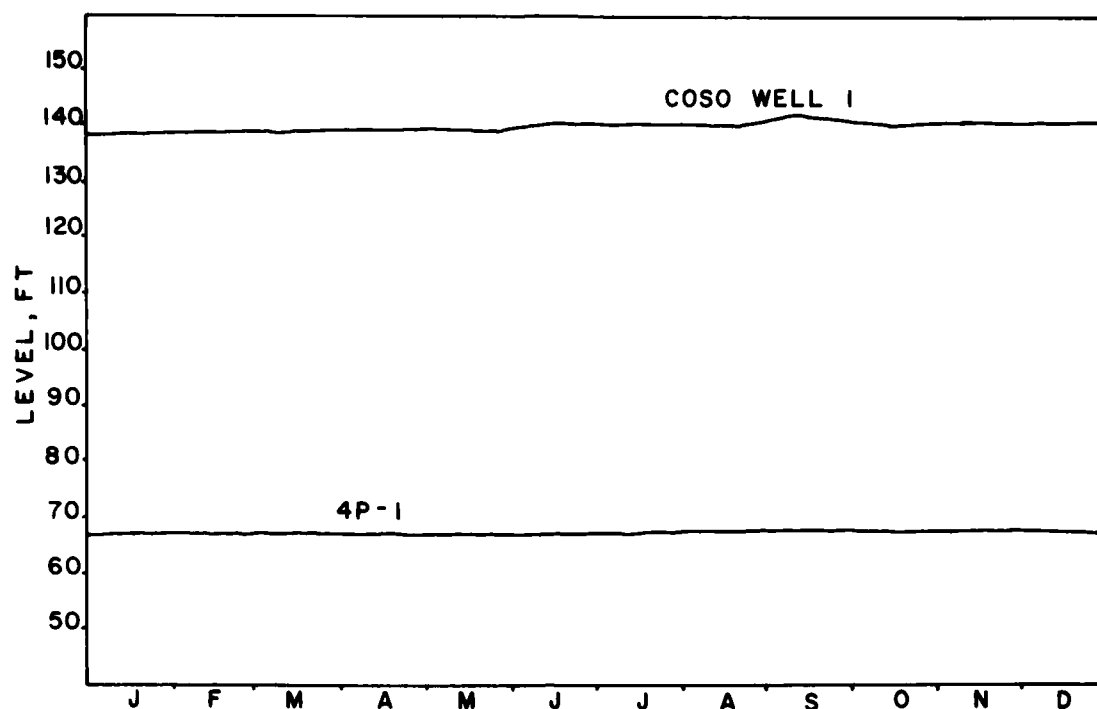


FIGURE 42. Water Levels of Coso Observation Wells, Coso Well 1 and 4P-1, 1982.

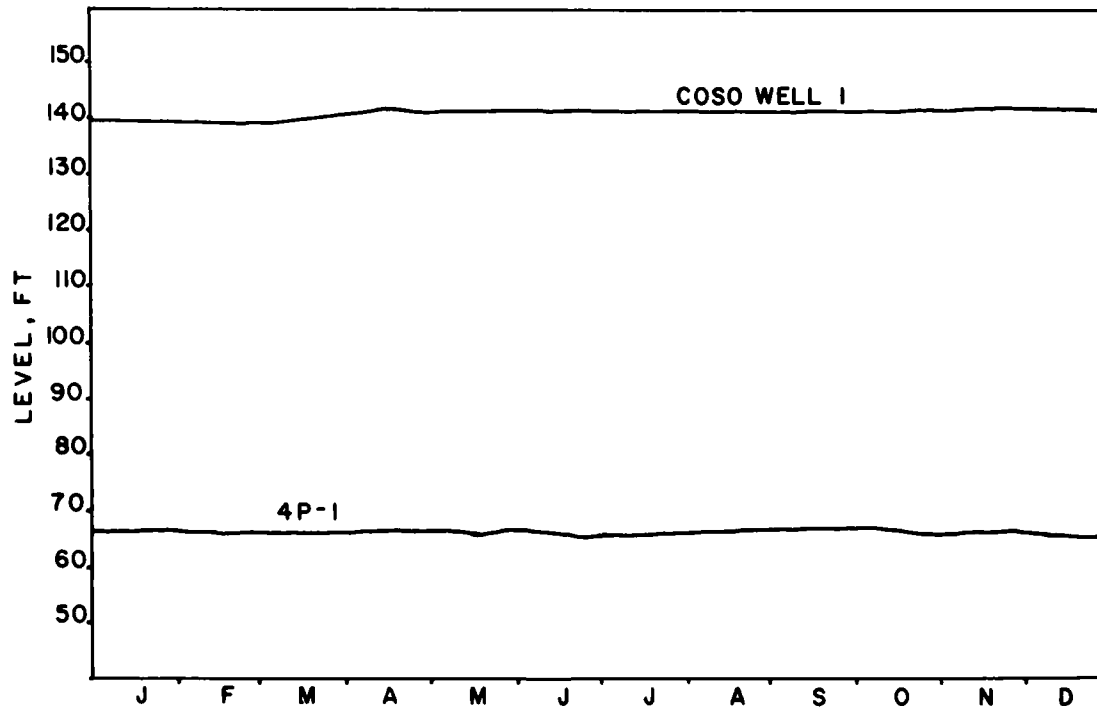


FIGURE 43. Water Levels of Coso Observation Wells, Coso Well 1 and 4P-1, 1983.

Coso Well 4P-1

Well 4P-1, located at site 8 in Figure 1, is a hot, fresh water well with a depth of 103 feet. This well was rehabilitated in 1978 as a sampling site and equipped with a water-level recorder in December 1979. The well, although hot, is very quiet compared to Coso Well 1 and recorder data are considered reliable. Figures 41 through 43, plotted from recorder data, show a constant water level at about 68 feet.

Coso Well 2

Well 2 was drilled by the Navy in April 1981 as an observation well. The well is also being used by California Energy Company, Inc., as a source of water for the geothermal drilling operation. The well was completed to 300 feet in the upper aquifer. Table 7 presents the water-level readings for Coso Well 2. The driller's log shows that the well intersects the water table at 125 feet, which should be accurate to within 1 or 2 feet. The next three readings were taken with an electric sounder. It was found that the sounder tended to get entangled in the pump wires so that subsequent measurements were made using the air-line method. This method consists of inserting tubing into the well to below the water level. A pressure gauge is installed at the wellhead end of the tubing ahead of an air source, in this case a bottle of liquid nitrogen. The device works on the principle that the air pressure required to push all the water out of the tubing equals the water pressure of a column of water of that height.

TABLE 7. Water Level Reading for Coso Well No. 2.

Date	Level		Comments
	ft	in.	
4-7-81	125	0	Driller's log (feet below ground level).
12-3-81	151	2	During drawdown.
4-29-82	134	2	During drawdown.
6-1-82	129	6	...
6-16-82	129	0	9.1 psi
8-24-82	129	0	9.1 psi
11-1-83	123	6	11.5 psi
11-18-83	123	4	11.6 psi
11-21-83	123	6	11.5 psi
11-28-83	123	6	11.5 psi

The pressure gauge reading is converted to feet of head by the formula

$$h = 150 \text{ ft} - P_g (\text{psi}) / 0.4333 \text{ psi/ft}$$

where h is the height of the water column, 150 is the total length (depth) of the tubing, and P_g is the gauge reading.

All 1982 readings were taken either during drawdown or during the recovery period. The 1983 readings probably indicate the static water level.

Pond Levels

Fluid level monitoring of the mud pots and pools was initiated in the last quarter of 1979 and includes two of the sites in the weekly photographic series. These are the red and gray pool and the south pool. A third site being monitored is a rocked-in cistern 30 feet south of the red and gray pool.

Tables 8, 9, and 10 list the pond level data for 1981, 1982, and 1983, respectively. Figures 44, 45, and 46 show data from two of the pools--the red and gray pool (mud pots) and the south pool--in relation to the ambient temperature and the cumulative annual rainfall within the Coso Basin. These data show the variation of water level from a reference point at the top of the cistern.

Water levels in the mud pots and pools are highest from January through April, which corresponds to the rainy season in the Coso Range, and fall to the lowest levels in July through September because of the very high evaporation rate during this period. Water levels begin to rise again in mid-September as more of the fumarole-supplied steam condenses and the evaporation rate decreases.

Rainfall is not a major factor in seasonal water level changes, although short-term effects can occasionally be seen. Figure 46 (data for 1983) shows a coincidence of two peaks in the water level of the mud pots with two showers in mid-August and late September. However, the major shower that occurred on 1 March had no apparent effect on the water levels.

Table 11 is a summary of the water-level data at the south pool for the last 4 years. There appears to be a trend of an increasing mean water level and less variation throughout the year. We suspect that the "trend" will reverse itself in 1984, however, based on the evaporation rate, high ambient temperature, and lack of rainfall in the early part of the year.

TABLE 8. Elevation Data on Coso Pools, 1981.

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
1-5	...	1 Red/gray	86.85	...
		2 Cistern	86.37	...
		3 South pool	94.62	...
1-12	...	1	86.85	0.0
		2	86.44	+0.84
		3	94.72	+1.2
1-19	59	1	86.86	+0.12
		2	86.45	+0.96
		3	94.85	+2.76
1-22	...	1	86.85	0.0
		2	86.39	+0.24
		3	94.82	+2.40
2-8	...	1	86.84	-0.12
		2	86.48	+1.32
		3	95.26	+7.68
2-17	71	1	86.47	-4.56
		2	86.36	-0.12
		3	95.24	+7.44
2-23	64	1	86.85	0.0
		2	86.35	-0.24
		3	95.22	+7.20
3-1	...	1	86.81	-0.48
		2	87.48	+13.32
		3	95.25	+7.56
3-10	...	1	86.83	-0.24
		2	86.48	+1.32
		3	95.67	+12.60
3-16	60	1	86.83	-0.24
		2	86.33	-0.48
		3	95.62	+12.00
4-9	...	1	86.69	-1.92
		2	85.85	-6.24
		3	95.34	+8.64

TABLE 8. (Contd.)

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in
5-5	...	1	86.64	-2.52
		2	85.68	-8.28
		3	94.75	+1.56
5-26	...	1	86.77	-0.96
		2	87.68	+15.72
		3	94.37	-3.00
6-2	87	1	86.67	-2.16
		2	85.79	-6.96
		3	94.22	-4.80
6-8	92	1 dry	86.50	-4.20
		2	85.48	-10.68
		3	94.10	-6.24
6-15	78	1 dry	86.50	-4.20
		2 dry	85.30	-12.84
		3	93.70	-11.04
6-22	107	1 dry	86.50	-4.20
		2 dry	85.30	-12.84
		3	93.50	-13.44
6-29	95	1 dry	86.50	-4.20
		2 dry	85.30	-12.84
		3	93.16	-17.52
7-6	99	1 dry	86.50	-4.20
		2 dry	85.30	-12.84
		3	92.92	-20.40
7-13	86	1 dry	86.50	-4.20
		2 dry	85.30	-12.84
		2	92.62	-24.00
7-20	94	1 dry	86.50	-4.20
		2 dry	85.30	-12.84
		3	92.62	-24.00
7-26	94	1 dry	86.50	-4.20
		2 dry	85.30	-12.84
		3	no data	no data

TABLE 8. (Contd.)

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
8-3	95	1 dry	86.50	-4.20
		2 dry	85.30	-12.84
		3	92.17	-29.50
8-10	96	1 dry	86.50	-4.20
		2 dry	85.30	-12.84
		3	91.70	-35.00
8-17	90	1	86.50	-4.20
		2 dry	85.30	-12.84
		3	91.70	-35.00
8-23	90	1 dry	86.50	-4.20
		2 dry	85.30	-12.84
		3	91.43	-38.25
8-31	88	1	86.46	-4.68
		2 dry	85.30	-12.84
		3	91.08	-42.50
9-8	86	1	86.65	-2.40
		2 dry	85.30	-12.84
		3	90.91	-44.50
9-15	86	1	86.65	-2.40
		2	85.54	-9.96
		3	91.45	-38.00
9-21	90	1	86.81	-0.48
		2	85.52	-10.20
		3	91.45	-38.00
9-28	80	1	86.67	-2.16
		2	85.64	-8.76
		3	91.45	-38.00
10-5	78	1	86.81	-0.48
		2	85.85	-6.24
		3	91.56	-36.75
10-13	57	1	86.85	0.0
		2	85.98	-4.68
		3	91.87	-33.00

TABLE 8. (Contd.)

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
10-18	76	1	86.81	-0.48
		2	85.91	-5.52
		3	92.31	-27.75
10-23	77	1	86.83	-0.24
		2	85.85	-6.24
		3	92.39	-26.75
11-2	79	1	86.81	-0.48
		2	85.64	-8.74
		3	92.77	-22.25
11-9	74	1	86.81	-0.48
		2	85.81	-6.72
		3	93.00	-19.50
11-16	70	1	86.90	+0.60
		2	85.95	-5.04
		3	93.35	-15.25
11-23	66	1	86.90	+0.60
		2	85.98	-4.68
		3	93.60	-12.25
11-30	56	1	86.90	+0.60
		2	86.24	-1.56
		3	93.64	-11.75
12-7	65	1	86.92	+0.84
		2	86.02	-4.20
		3	94.08	-6.50
12-14	67	1	86.92	+0.84
		2	85.81	-6.72
		3	94.10	-6.25
12-18	46	1	86.92	+0.84
		2	85.83	-6.48
		3	94.31	-3.75
12-28	54	1	86.92	+0.84
		2	85.85	-6.24
		3	94.45	-2.00

TABLE 9. Elevation Data on Coso Pools, 1982.

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
1-11	63	1 Red/gray	86.92	0.0
		2 Cistern	85.85	0.0
		3 South pool	95.30	0.0
1-18	52	1	86.90	-0.24
		2	85.91	+0.72
		3	95.38	+0.96
1-26	57	1	86.92	0.0
		2	86.00	+1.80
		3	95.44	+1.68
2-1	57	1	86.88	-0.48
		2	85.81	-0.48
		3	95.40	+1.20
2-8	48	1	86.89	-0.36
		2	85.91	+0.72
		3	95.42	+1.44
2-16	71	1	86.90	-0.24
		2	85.95	+1.20
		3	95.49	+2.28
2-23	66	1	86.83	-1.08
		2	85.81	-0.48
		3	95.49	+2.28
3-1	60	1	86.83	-1.08
		2	85.73	-1.44
		3	95.46	+1.92
3-7	60	1	86.85	-0.84
		2	85.77	-0.96
		3	95.44	+1.68
3-15	61	1	86.90	-0.24
		2	85.95	+1.20
		3	95.40	+1.20
3-22	58	1	86.83	-1.08
		2	86.18	+3.96
		3	95.84	+6.48

TABLE 9. (Contd.)

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
3-29	51	1	86.88	-0.48
		2	86.14	+3.48
		3	95.74	+5.28
4-5	64	1	86.92	0.0
		2	85.93	+0.96
		3	95.74	+5.28
4-12	70	1	86.88	-0.48
		2	86.23	+4.56
		3	95.74	+5.28
4-19	70	1	86.79	-1.56
		2	85.89	+0.48
		3	95.61	+3.72
4-26	75	1	86.77	-1.80
		2	85.89	+0.48
		3	95.40	+1.20
5-3	78	1	86.75	-2.04
		2	85.93	+0.96
		3	95.28	-0.24
5-10	64	1	86.75	-2.04
		2	85.93	+0.96
		3	95.15	-1.80
5-17	...	1	86.75	-2.04
		2	85.93	+0.96
		3	95.07	-2.76
5-24	...	1	86.56	-4.32
		2	85.60	-3.00
		3	94.82	-5.76
5-31	87	1	86.46	-5.52
		2	Dry	No data
		3	94.65	-7.80
6-7	77	1	86.63	-3.48
		2	Dry	No data
		3	94.49	-9.72

TABLE 9. (Contd.)

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
6-14	87	1	86.17	-9.00
		2	Dry	No data
		3	94.36	-11.28
6-21	90	1	86.63	-3.48
		2	Dry	No data
		3	94.24	-12.72
6-28	91	1	Dry	No data
		2	Dry	No data
		3	94.07	-14.76
7-6	85	1	86.50	-5.04
		2	Dry	No data
		3	93.82	-17.76
7-12	95	1	Dry	No data
		2	Dry	No data
		3	93.75	-18.60
7-19	97	1	Dry	No data
		2	Dry	No data
		3	93.51	-21.48
7-26	92	1	Dry	No data
		2	Dry	No data
		3	93.15	-25.80
8-2	89	1	86.48	-5.28
		2	86.77	+11.04
		3	93.24	-24.72
8-9	94	1	86.61	-3.72
		2	85.70	-1.80
		3	93.05	-27.00
8-16	90	1	86.67	-3.00
		2	85.73	-1.44
		3	93.07	-26.76
8-25	82	1	86.71	-2.52
		2	85.85	0.0
		3	92.86	-29.28

TABLE 9. (Contd.)

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
8-30	89	1	86.92	0.0
		2	85.98	+1.56
		3	92.86	-29.28
9-8	88	1	86.75	-2.04
		2	86.02	+2.04
		3	92.69	-31.32
9-13	92	1	86.90	-0.24
		2	86.14	+3.48
		3	92.82	-29.76
9-21	82	1	86.98	+0.72
		2	86.27	+5.04
		3	No data	No data
9-27	...	1	86.94	+0.24
		2	86.35	+6.00
		3	No data	No data
10-5	68	1	86.94	+0.24
		2	86.39	+6.48
		3	93.09	-26.52
10-12	74	1	86.96	-0.48
		2	86.33	+5.76
		3	93.19	-25.32
10-18	78	1	86.96	+0.48
		2	86.39	+6.48
		3	93.38	-23.04
10-26	64	1	86.96	+0.48
		2	85.58	-3.24
		3	93.89	-16.92
11-2	68	1	86.94	+0.24
		2	86.39	+6.48
		3	94.20	-13.20
11-8	60	1	86.96	+0.48
		2	85.71	-1.68
		3	94.29	-12.12

TABLE 9. (Contd.)

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
11-16	56	1	86.92	0.0
		2	86.64	+9.48
		3	95.05	-3.00
11-22	52	1	86.96	+0.48
		2	86.60	+9.00
		3	95.26	-0.48
11-28	66	1	86.98	+0.72
		2	86.60	+9.00
		3	95.26	-0.48
12-6	61	1	86.94	+0.24
		2	86.64	+9.48
		3	95.26	-0.48

TABLE 10. Elevation Data on Coso Pools, 1983.

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
1-9	60	1 Red/gray	86.90	0.0
		2 Cistern	86.31	0.0
		3 South pool	95.56	0.0
1-17	60	1	86.94	+0.48
		2	86.60	+3.48
		3	95.81	+3.00
1-24	58	1	86.96	+0.72
		2	86.85	+6.48
		3	95.89	+3.96
1-31	58	1	86.96	+0.72
		2	86.37	+0.72
		3	95.89	+3.96
2-7	58	1	86.96	+0.72
		2	86.66	+4.20
		3	95.56	0.0
2-14	55	1	86.98	+0.96
		2	86.41	+1.20
		3	96.66	+13.20
2-22	67	1	86.98	+0.48
		2	86.39	+0.96
		3	96.47	+10.92
2-28	47	1	86.94	+0.48
		2	86.64	+3.96
		3	No data	No data
3-8	61	1	86.96	+0.72
		2	86.56	+3.00
		3	No data	No data
3-16	58	1	86.96	+0.72
		2	86.39	+0.96
		3	No data	No data
3-21	50	1	86.96	+0.72
		2	86.52	+2.52
		3	No data	No data

TABLE 10. (Contd.)

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
3-28	62	1	86.96	+0.72
		2	86.39	+0.96
		3	No data	No data
4-4	62	1	86.96	+0.72
		2	86.35	+0.48
		3	No data	No data
4-11	55	1	86.94	+0.48
		2	86.39	+0.96
		3	No data	No data
4-18	67	1	86.96	+0.72
		2	86.39	+0.96
		3	No data	No data
4-25	64	1	86.96	+0.72
		2	86.27	-0.48
		3	97.41	+22.20
5-2	70	1	86.92	+0.24
		2	86.06	-3.00
		3	96.94	+16.56
5-9	79	1	86.91	+0.12
		2	86.10	-2.52
		3	96.73	+14.04
5-16	72	1	86.83	-0.84
		2	86.02	-3.48
		3	96.52	+11.52
5-23	...	1	86.67	-2.76
		2	85.85	-5.52
		3	95.85	+3.48
6-6	94	1	86.63	-3.24
		2	85.68	-7.56
		3	95.23	-3.96
6-13	84	1	86.58	-3.84
		2	Dry	No data
		3	95.14	-5.04

TABLE 10. (Contd.)

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
6-20	88	1	86.50	-4.80
		2	Dry	No data
		3	94.98	-6.96
6-27	84	1	86.50	-4.80
		2	Dry	No data
		3	94.64	-11.04
7-5	93	1	86.50	-4.80
		2	Dry	No data
		3	94.39	-14.04
7-11	94	1	Dry	No data
		2	Dry	No data
		3	94.56	-12.00
7-20	90	1	86.50	-4.80
		2	Dry	No data
		3	94.68	-10.56
7-25	87	1	86.48	-5.04
		2	Dry	No data
		3	94.73	-9.96
8-1	91	1	86.54	-4.32
		2	Dry	No data
		3	94.56	-12.00
8-8	84	1	Dry	No data
		2	Dry	No data
		3	94.31	-15.00
8-22	76	1	86.88	-0.24
		2	Dry	No data
		3	94.27	-15.48
8-29	89	1	86.75	-1.80
		2	Dry	No data
		3	94.27	-15.48
9-6	88	1	86.63	-3.24
		2	Dry	No data
		3	94.23	-15.96

TABLE 10. (Contd.)

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
9-12	98	1	86.65	-3.00
		2	Dry	No data
		3	94.03	-18.36
9-19	89	1	86.67	-2.76
		2	Dry	No data
		3	93.85	-20.52
9-27	76	1	86.88	-0.24
		2	Dry	No data
		3	93.85	-20.52
10-3	78	1	86.98	+0.96
		2	86.43	+1.44
		3	94.29	-15.24
10-11	74	1	86.96	+0.72
		2	86.35	+0.48
		3	94.39	-14.04
10-17	70	1	86.96	+0.72
		2	86.31	0.0
		3	94.52	-12.48
10-25	76	1	86.96	+0.72
		2	86.22	-1.08
		3	94.69	-10.44
10-31	68	1	86.92	+0.24
		2	86.22	-1.08
		3	94.69	-10.44
11-7	70	1	86.96	+0.72
		2	86.39	+0.96
		3	95.02	-6.48
11-14	68	1	86.96	+0.72
		2	86.41	+1.20
		3	95.14	-5.04
11-21	...	1	86.98	+0.96
		2	86.52	+2.52
		3	No data	No data

TABLE 10. (Contd.)

Date	Ambient temperatures, °F	Pool designation	Relative elevation, ft	Change in elevation, in.
11-28	...	1	86.96	+0.72
		2	86.43	+1.44
		3	95.92	+4.26
12-5	...	1	86.96	+0.72
		2	86.56	+3.00
		3	96.11	+6.60
12-12	...	1	86.96	+0.72
		2	86.52	+2.52
		3	96.11	+6.60
12-16	...	1	86.92	+0.24
		2	86.43	+1.44
		3	96.09	+6.35
12-28	...	1	87.00	+1.20
		2	86.64	+3.96
		3	No data	No data
		lost float		

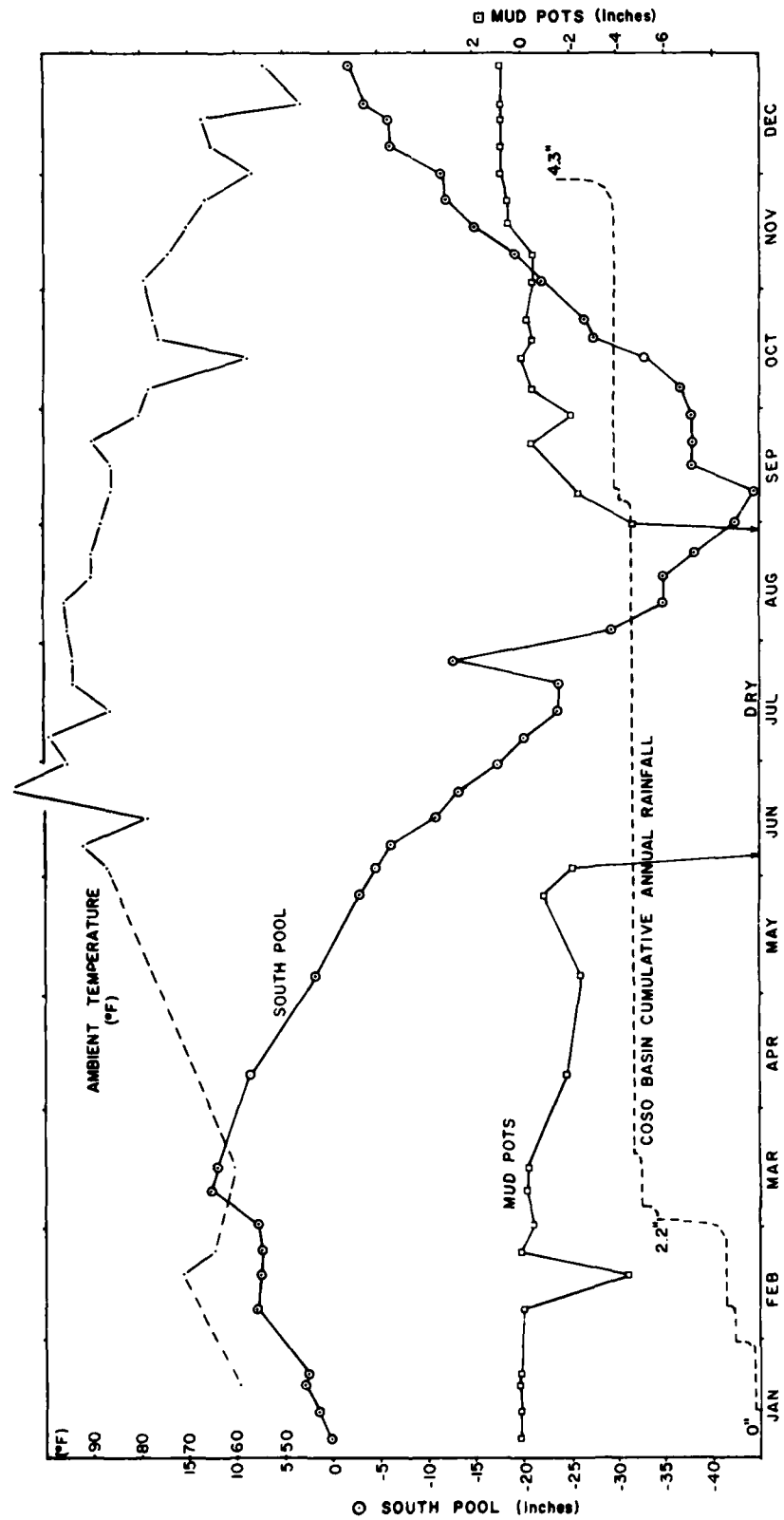


FIGURE 44. Comparison of Coso Pond Levels With Annual Rainfall and Ambient Temperature, 1981.

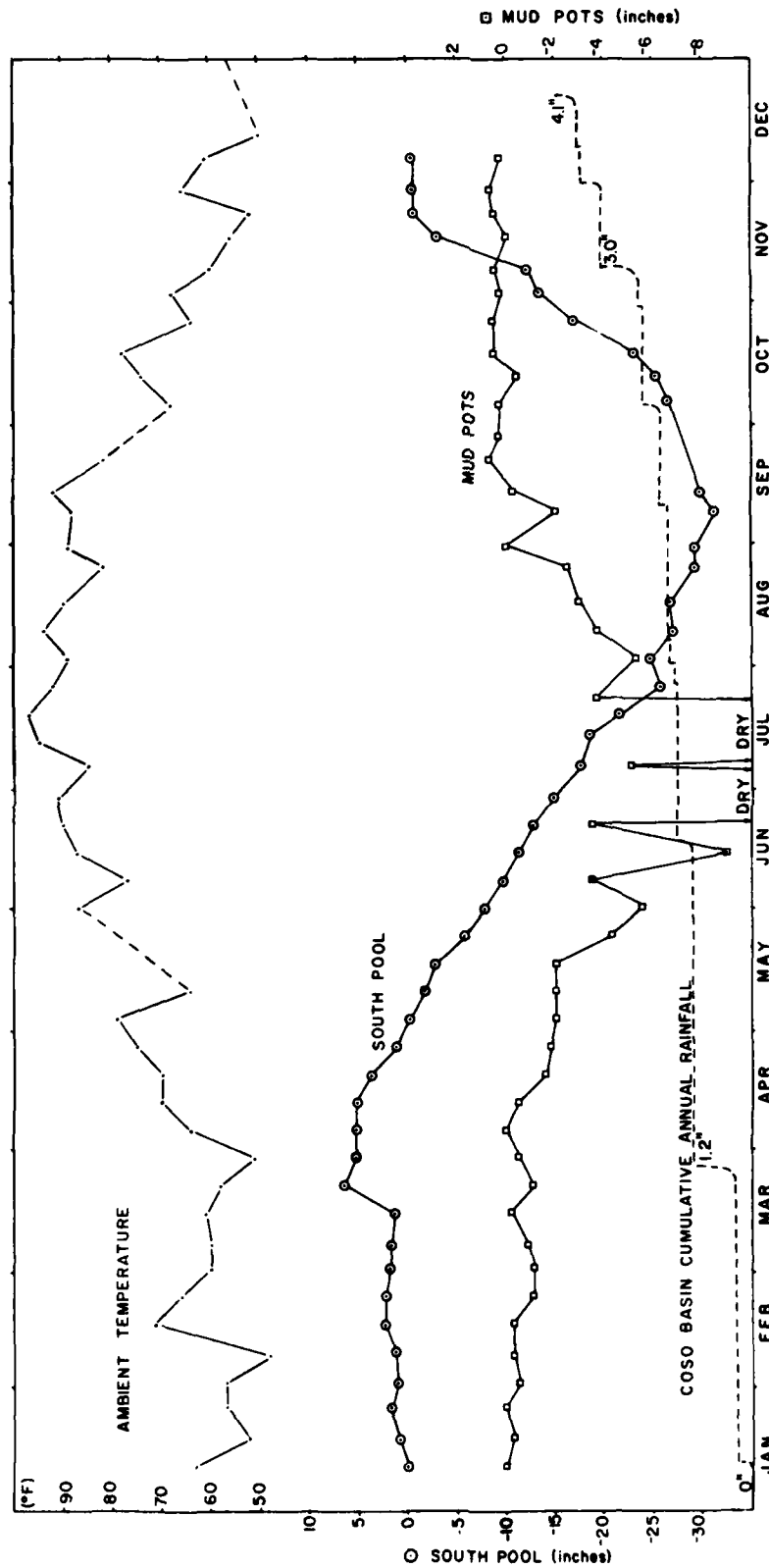


FIGURE 45. Comparison of Coso Pond Levels With Annual Rainfall and Ambient Temperature, 1982.

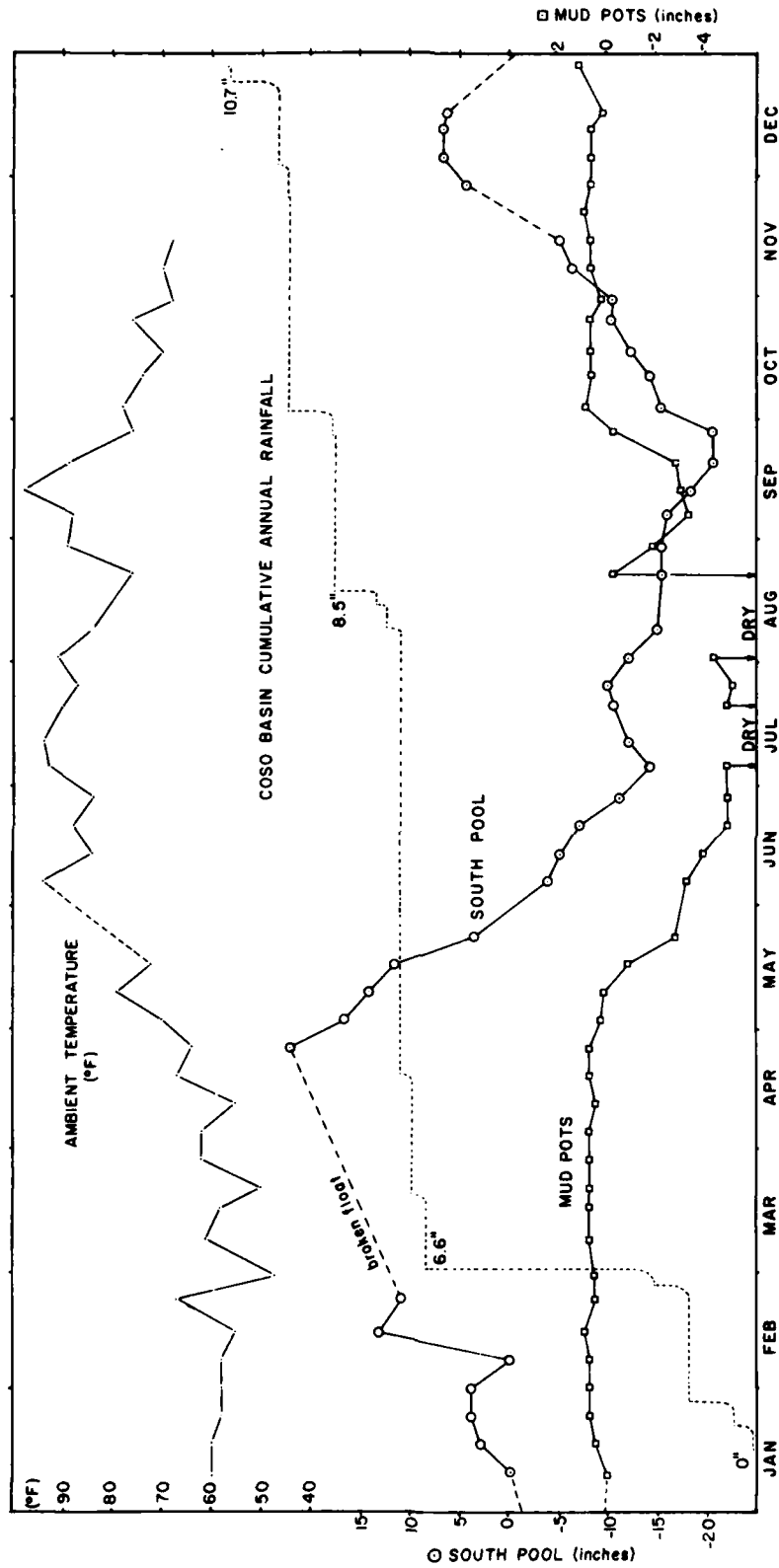


FIGURE 46. Comparison of Coso Pond Levels With Annual Rainfall and Ambient Temperature, 1983.

TABLE 11. Summary of Water Level, in Feet, at South Pool, 1980-83.

Year	High	Low	Mean	Standard deviation
1980	96.3	91.3	93.8	1.8
1981	95.7	90.9	93.4	1.4
1982	95.8	92.7	94.5	1.0
1983	97.4	93.9	95.5	1.1

A study of the evaporation rate at the south pond was initiated in 1982 but inconsistencies rendered the data of little use. A new study was begun in spring 1984. The study will include a quarterly areal and temperature survey of the pond(s) in conjunction with a 1- to 2-week two-pan water-evaporation-rate study. This study should result in good baseline data on the seasonal variability of the evaporation rate at Coso.

RAINFALL AT COSO RESORT AND ROSE VALLEY

Rainfall in the Coso Hot Springs subbasin is monitored at five sites as shown in Figure 47. Instrumentation at each site includes both battery-powered digital readout gauges and manually read funnel gauges. The digital instruments have not proven reliable, and, therefore, the rainfall totals reported are from the manual readings.

Data collected from the Coso stations are presented in Tables 12, 13, and 14. Daily averages and cumulative totals for these data are given in Tables 15, 16, and 17 along with the daily and cumulative data for rainfall in Rose Valley to the west. The Rose Valley data are collected at the Los Angeles Department of Water and Power (LADWP) Haiwee Reservoir plant.

As can be seen, the Coso area consistently receives less annual rainfall than does Rose Valley. Although the nature of high-desert storms often results in differential precipitation between any two given sites, the Haiwee Reservoir station probably receives more rain because of its proximity to the Sierra Nevada.

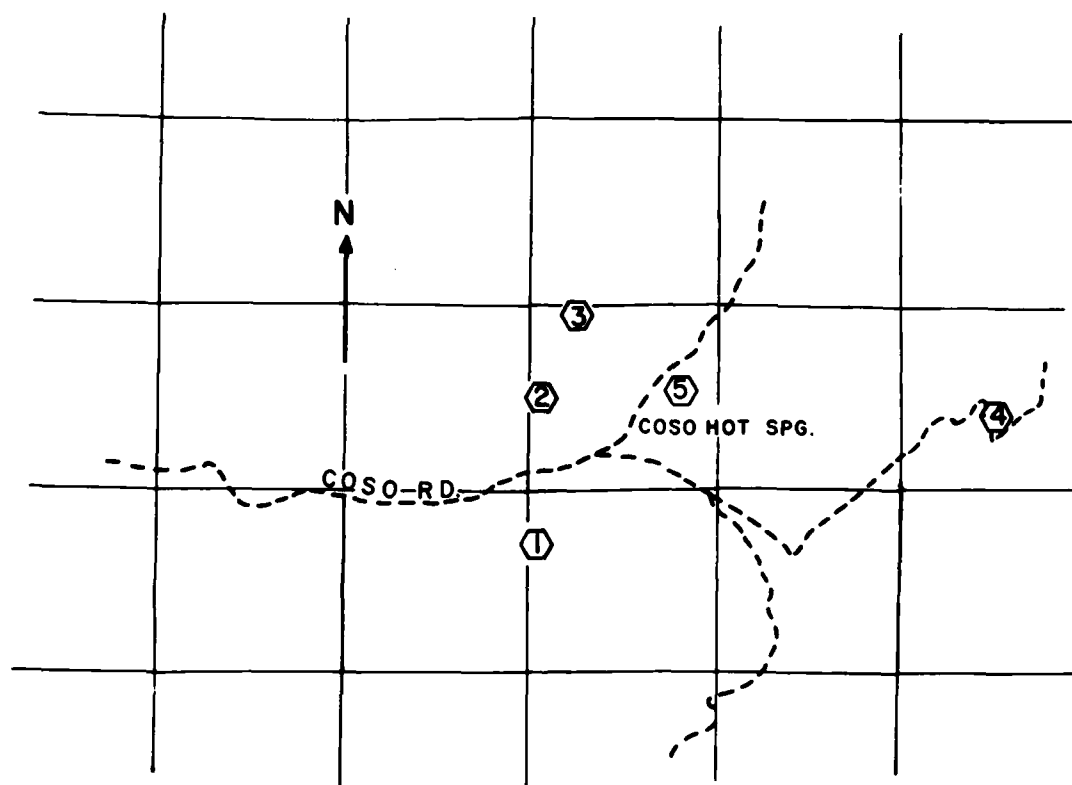


FIGURE 47. Rainfall Monitoring Station Locations.

TABLE 12. Inches of Rainfall Recorded at Coso Monitoring Stations, 1981.

Date	Station 1		Station 2		Station 3		Station 4		Station 5	
	Funnel	Tipping bucket	Funnel	Tipping bucket	Funnel	Tipping bucket	Funnel	Tipping bucket	Funnel	Tipping bucket
1-12	0.17	0.14	0.14	0.14	0.14	0.14	0.11	...	0.15	0.11
1-23	0.12	0.13	0.10	0.08	0.10	0.11	0.13	...	0.13	0.13
1-27/29	0.36	0.31	0.36	0.36	0.29	0.35	0.62	...	0.38	0.37
2-8	0.22	0.19	0.18	0.17	0.19	0.22	0.22	...	0.19	0.19
2-25 through 3-1	1.65	1.38	1.45	1.48	1.22	1.38	1.25	...	1.23	...
3-5	0.34	0.37	0.27	0.27	0.24	0.27	0.20	...	0.23	...
3-19/20	0.12	...	0.13	...	0.11	...	0.29	...	0.11	...
5-28	Trace	...	Trace	...	Trace	...	Trace	...	Trace	...
8-10/13	0.16	...	...	0.38	0.18	...	...	0.14	...	0.30
9-6	0.51	...	0.51	...	0.13	...	...	...	0.10	0.10
9-9	0.17	...	0.12	...	0.05	...	...	0.03	0.11	0.11
11-28/29	1.05	1.72	1.11	0.93	1.30	1.48	1.24	...	1.50	1.52
Total	4.87	(4.24) ^a	4.37	(3.81) ^a	3.95	(3.95) ^a	4.06	(0.17) ^a	4.13	(2.83) ^a

^aUnreliable data.

TABLE 13. Inches of Rainfall Recorded at Coso Monitoring Stations, 1982.

Date	Station 1		Station 2		Station 3		Station 4		Station 5	
	Funnel	Tipping bucket	Funnel	Tipping bucket	Funnel	Tipping bucket	Funnel	Tipping bucket	Funnel	Tipping bucket
1-9	0.26	0.51	0.14	0.18	0.17	0.34	...	...	0.41	0.41
1-19	...	...	...	...	...	...	...	...	...	0.36
1-28	...	0.04	...	...	...	...	...	...	...	...
3-1	0.30	0.32	0.22	0.43	0.24	0.58	...	...	...	...
3-27	1.00	0.86	0.71	0.91	1.05	0.45	...	...	0.26	0.22
4-1	...	...	...	...	...	...	...	...	0.02	0.01
5-3	...	...	...	...	...	0.01	0.05	...	...	...
6-19	0.06	0.43	0.88	0.24	0.16	0.28	...	...	0.12	0.16
7-27	0.05	0.08	0.03	0.04	0.02	...	...	0.01	0.01	0.02
8-1	0.03	0.15	0.04	0.12	0.26	0.26	...	...	0.17	0.17
8-7	0.03	0.09	0.02	0.06	0.09	0.18	...	0.09	0.05	0.08
9-10	0.14	0.23	0.18	0.14	0.12	0.16	...	...	0.16	0.16
9-21	...	...	...	...	...	...	...	0.25	...	0.27
9-27	...	...	...	...	...	...	...	0.27	...	0.26
10-5	0.37	0.82	0.44	0.58	0.38	0.79	...	...	0.30	...
10-26	...	...	...	...	...	...	...	...	0.08	0.01
10-30	0.11	0.21	0.06	0.07	0.05	0.10	...	0.02	...	0.01
11-9	0.67	0.70	0.69	0.58	0.65	0.63	...	0.01	0.95	0.04
11-30	0.48	0.61	0.44	0.32	0.44	0.41	...	...	0.44	0.34
12-9	0.05	0.08	0.04	0.03	0.04	0.05	...	0.03	0.02	0.03
12-22	0.54	0.68	0.47	0.33	0.50	0.50	...	0.05	0.60	0.45
Total	4.09	(5.81) ^a	4.36	(4.03) ^a	4.17	(4.74) ^a	(0.05) ^a	(0.73) ^a	3.59	(3.00) ^a

^aUnreliable data.

TABLE 14. Inches of Rainfall Recorded at Coso Monitoring Stations, 1983.

Date	Station 1		Station 2		Station 3		Station 4		Station 5	
	Funnel	Tipping bucket	Funnel	Tipping bucket	Funnel	Tipping bucket	Funnel	Tipping bucket	Funnel	Tipping bucket
1-16	...	...	...	...	...	...	...	0.01	0.14	0.14
1-22	0.54	0.65	0.53	0.37	0.51	0.51	...	0.02	0.06	0.04
1-24	...	...	...	...	...	...	...	...	...	0.44
1-29	0.84	0.78	0.80	0.60	0.76	0.88	...	...	1.24	0.98
2-2	0.02	0.04	0.03	0.06	0.02	0.04	...	...	...	0.01
2-27	0.76	1.13	0.66	0.64	0.75	0.93	...	...	0.52	0.57
3-3	4.65	7.08	4.15	4.32	5.15	4.80	...	...	4.45	4.46
3-20	0.28	0.40	0.27	0.25	0.27	0.31	...	...	0.32	0.28
4-19	0.29	0.39	0.26	0.21	0.27	0.42	...	...	0.14	0.14
8-9	0.20	0.24	0.27	0.17	0.33	0.36	...	...	0.28	0.01
8-15	0.20	0.26	0.18	0.12	0.16	0.14	...	...	0.17	...
8-18	0.87	1.00	0.97	0.52	1.05	0.62	...	...	0.66	...
9-26	0.03	0.04	0.03	0.06	0.03	0.18	...	...	0.02	0.01
10-2	0.94	1.09	0.92	0.16	0.87	0.20	0.82	...	0.81	...
10-7	...	0.02	...	...	...	...	...	...	...	0.02
11-25	0.03	0.11	0.03	0.05	0.03	0.02	0.04	...	0.01	0.01
12-3	0.25	0.30	0.20	0.14	0.18	0.03	0.25	...	0.19	0.01
12-25	[1.00] ^a	...	[1.00] ^a	...	[1.00] ^a	...	1.23	...	1.17	...
12-28	...	...	...	...	...	...	...	...	0.02	...
Total	10.90	(13.53) ^b	10.30	(7.67) ^b	11.38	(9.44) ^b	(2.34) ^b	(0.03) ^b	10.20	(7.12) ^b

^aInferred data.^bUnreliable data.

TABLE 15. 1981 Cumulative Rainfall, in.

Rose Valley			Coso ^a		
Date	Daily	Cum.	Date	Daily	Cum.
1-12	0.12	0.12	1-12	0.14	0.14
1-13	0.02	0.14			
1-23	Trace	Trace	1-23	0.12	0.26
1-28	0.05	0.19	1-28	0.40	0.66
1-29	0.13	0.32			
1-30	0.15	0.47			
2-9	0.21	0.68	2-8	0.20	0.86
2-26	0.03	0.71			
3-2	1.43	2.14	3-1	1.36	2.22
3-3	0.01	2.15			
3-5	0.09	2.24	3-5	0.26	2.48
3-6	0.60	2.84			
3-7	0.03	2.87			
3-13	0.06	2.93			
3-14	0.01	2.94			
3-20	0.13	3.07	3-19	0.15	2.63
4-19	0.04	3.11			
5-27	0.22	3.33			
5-28	0.19	3.52	5-28	Trace	Trace
5-31	0.58	4.10			
8-15	0.03	4.13	8-13	0.07	2.70
9-7	0.03	4.16	9-6	0.25	2.95
9-9	0.55	4.71	9-9	0.09	3.04
10-1	0.01	4.72			
10-2	0.22	4.94			
10-3	0.01	4.95			
11-6	Trace	Trace			
11-14	0.06	5.01			
11-15	Trace	Trace			
11-28	0.42	5.43			
11-29	0.91	6.34	11-29	1.24	4.28

^aFrom funnels at stations 1, 2, 3, and 5 only.

TABLE 16. 1982 Cumulative Rainfall, in.

Rose Valley			Coso ^a		
Date	Daily	Cum.	Date	Daily	Cum.
1-1	0.10	0.10			
1-2	Trace	Trace			
1-5	0.32	0.42			
1-6	0.06	0.48	1-9	0.245	0.245
1-20	0.05	0.53			
1-21	0.05	0.58			
2-11	0.05	0.63	3-1	0.085	0.33
3-2	Trace	Trace			
3-3	0.03	0.66			
3-10	Trace	Trace			
3-11	Trace	Trace			
3-14	Trace	Trace			
3-15	0.04	0.70			
3-17	0.07	0.77			
3-18	0.71	1.48			
3-19	Trace	Trace			
3-26	0.04	1.52	3-27	0.86	1.19
3-29	Trace	Trace			
3-30	0.01	1.53			
4-1	Trace	Trace			
4-11	0.02	1.55			
4-12	0.45	2.00			
5-3	0.34	2.34			
5-5	0.01	2.35			
5-12	0.02	2.37			
6-18	0.01	2.38	6-18	0.31	1.50
6-20	0.03	2.41			
7-1	0.04	2.45			
7-27	0.15	2.60	7-26	0.03	1.53
			8-1	0.12	1.65
8-7	0.09	2.69	8-7	0.05	1.70
8-8	0.01	2.70			
			9-10	0.15	1.85
9-18	0.10	2.80			
9-19	0.08	2.88			
9-25	0.23	3.11			
9-26	0.21	3.32			
			10-5	0.37	2.22
10-25	0.02	3.34			
10-26	0.01	3.35			
10-27	0.01	3.36	10-30	0.08	2.30
11-10	0.85 ^b	4.21	11-9	0.74	3.04
11-19	0.08	4.29			
12-1	0.18	4.47	11-30	0.45	3.49
12-10	0.18	4.65	12-9	0.04	3.53
12-23	0.61	5.26	12-22	0.52	4.05

^aFrom funnels at stations 1, 2, 3, and 5 only.^bIncludes 0.20-in. snowfall.

TABLE 17. 1983 Cumulative Rainfall, in.

Rose Valley			Coso ^a		
Date	Daily	Cum.	Date	Daily	Cum.
1-16	0.01	0.01	1-16	0.03	0.03
1-23	0.72	0.73	1-22	0.41	0.44
1-24	0.13	0.86			
1-25	0.10	0.96			
1-27	0.09	1.05			
1-28	0.32	1.37			
1-29	0.27 ^b	1.64	1-29	0.91	1.35
2-3	0.27	1.91	2-2	0.02	1.37
2-6	0.02	1.93			
2-7	0.03	1.96			
2-8	0.14	2.10			
2-19	0.05	2.15			
2-25	0.22	2.37			
2-26	0.14	2.51			
2-27	0.34	2.85	2-27	0.67	2.04
2-28	0.05	2.90			
3-1	0.72	3.62			
3-2	1.62	5.24			
3-3	0.66	5.70	3-3	4.60	6.64
3-14	0.03	5.93			
3-17	0.02	5.95			
3-21	0.09	6.04	3-20	0.29	6.93
3-23	0.10	6.14			
3-24	0.18	6.32			
4-17	0.15	6.47			
4-18	0.01	6.48			
4-19	0.10	6.58	4-19	0.24	7.17
4-20	0.11	6.69			
8-8	0.04	6.73			
8-9	0.60	7.33	8-9	0.27	7.44
8-10	0.10	7.43			
8-15	0.33	7.76	8-15	0.18	7.62
8-16	0.08	7.84			
8-18	0.36	8.20	8-18	0.88	8.50
8-19	0.74	8.94			
8-20	0.25	9.19			
9-29	0.05	9.24	9-26	0.03	8.53
10-1	0.71	9.95			
10-2	0.05	10.00	10-2	0.89	9.42
11-2	0.01	10.01			
11-12	0.15	10.16			
11-20	0.10	10.26			
11-21	0.08	10.34			
11-25	0.15	10.49	11-25	0.02	9.44
12-4	0.38	10.87	3	0.20	9.64
12-10	0.23	11.10			
12-25	0.70	11.80	12-25	1.04	10.68
12-26	0.34	12.14	12-28	0.02	10.70

^a From funnels at stations 1, 2, 3, and 5 only.^b Includes 0.40-in. snowfall.

WATER ANALYSIS OF COSO WELLS

Water sampling of the four Coso observation wells (Coso Well 1, 4P-1, 4K-1, and Coso Well 2) being monitored for chemical composition was conducted five times in the 3-year period covered by this report. Tables 18 through 21 show the chemical analysis for each well, the analyses being performed by B-C Laboratories, Bakersfield, Calif.

Monitoring of fluid characteristics is basically dependent on satisfactory analyses. A measure of the quality of major ion analysis is to compare the electrical balance between cations and anions as reported on the analysis sheets. This was done, and the results are listed in Table 22.

Unfortunately, this method gives no indication as to the quality of the trace element analyses.

The waters from these sample sites are mixtures of three waters of different origin:

1. Shallow alluvial ground water
2. Condensed steam
3. Geothermal reservoir water

The shallow alluvial ground water is probably characterized by the calcium content being greater than sodium, significant quantities of magnesium, low potassium, and sulfate being higher but close to the chloride content. Total dissolved solids (TDS) are expected to be in the few hundred parts per million.

The condensed steam is characterized by low TDS with low calcium and very low magnesium content. The dominant anions are sulfate (major) and carbonate and bicarbonate (minor). (Noncondensable gases in geothermal systems include carbon dioxide.) The geothermal waters will have sodium as the dominant cation, with relatively high potassium, low calcium, and very low magnesium content. The dominant anion will be chloride. The TDS will be in the 5000- to 6000-ppm range.

Figures 48 and 49 are ternary diagrams that graphically show the relative positions of the four well fluids in a calcium-sodium/potassium-magnesium system and a sulfate-carbonate/bicarbonate-chloride system.

TABLE 18. Chemical Analysis of Coso Well 1.

Constituent, ppm	5-28-81	12-11-81	4-20-82	4-19-83	11-23-83
Calcium	88.0	58.0	47.0	52.0	20.0
Magnesium	0.20	0.04	0.03	<0.01	0.02
Sodium	4750.0	3350.0	2450.0	2750.0	3600.0
Potassium	770.0	450.0	380.0	460.0	510.0
Hydroxide	...	...	7.3	0.0	0.0
Carbonate	0.00	32.4	76.7	51.1	0.0
Bicarbonate	268.5	225.2	0.0	91.8	208.0
Chloride	7703.0	5412.7	3929.4	4602.0	5947.0
Sulfate	230.0	150.0	180.0	130.0	150.0
Nitrate	1.3	2.7	1.3	1.8	2.2
Fluoride	6.2	5.6	4.2	4.3	5.2
Iron	2.4	<0.05	0.18	<0.05	<0.05
Manganese	0.02	0.01	0.01	<0.01	0.02
Arsenic	10.00	15.00	7.8	10.0	18.5
Copper	0.05	0.03	0.01	0.01	0.03
Zinc	2.00	0.08	0.02	0.44	0.07
Total dissolved solids	14294.0	10084.0	7458.0	8706.0	10944.0
Mercury	<0.0002	<0.0002	0.0007	<0.0002	<0.0002
Nitrite	0.02	0.006	0.006	<0.001	<0.01
Lithium	36.0	26.0	24.5	14.3	34.5
Silica	330.0	385.0	328.0	410.0	450.0
Aluminum	<0.10	<0.10	<0.10	<0.1	<0.1
Boron	64.00	48.0	23.0	107.0	124.0
Phosphate	32.1	0.4	0.8	10.5	0.6
Bromide	8.5	0.2	0.2	11.0	0.5
Ammonium	2.0	<0.4	<0.2	0.2	0.2
Electrical conductivity, K x 10 ⁶	18515.0	16400.0	13400.0	12700.0	17500.0
pH value	7.8	8.5	9.1	8.5	8.1

TABLE 19. Chemical Analysis of Well 4P-1.

Constituent, ppm	5-28-81	12-11-81	4-20-82	4-19-83	11-23-83
Calcium	4.5	3.5	6.5	6.2	3.6
Magnesium	<0.01	<0.01	0.02	0.11	0.07
Sodium	43.0	27.0	28.0	24.0	27.0
Potassium	16.0	14.0	14.5	12.6	13.8
Hydroxide	...	...	0.0	0.0	0.0
Carbonate	0.0	0.0	6.8	0.0	0.0
Bicarbonate	71.9	67.6	52.8	69.3	78.0
Chloride	13.1	<1.8	<1.8	<1.8	1.8
Sulfate	45.0	30.0	41.0	27.0	19.0
Nitrate	<0.4	<0.4	<0.4	<0.4	<0.4
Fluoride	0.54	0.20	0.43	0.42	0.54
Iron	1.1	<0.05	0.22	0.09	0.12
Manganese	<0.01	0.01	0.01	<0.01	0.02
Arsenic	0.05	0.01	0.04	<0.01	0.01
Copper	<0.01	0.01	<0.01	<0.01	<0.01
Zinc	0.02	0.01	0.01	0.03	<0.01
Total dissolved solids	356.0	308.0	311.0	306.0	393.0
Mercury	0.0020	0.0003	0.0002	0.0004	<0.0002
Nitrite	0.006	0.004	<0.001	<0.001	<0.001
Lithium	0.18	0.04	0.04	0.02	0.02
Silica	160.0	164.0	160.0	165.0	230.0
Aluminum	<0.1	0.1	<0.1	<0.1	<0.1
Boron	0.90	0.10	0.11	0.05	0.12
Phosphate	0.60	<0.1	<0.1	<0.1	0.1
Bromide	<0.1	<0.1	0.4	<0.1	<0.1
Ammonium	2.0	1.4	1.8	1.3	1.5
Electrical conductivity, K x 10 ⁶	280.0	194.0	263.0	175.0	200.0
pH value	8.0	7.3	9.0	7.6	7.7

TABLE 20. Chemical Analysis of Well 4K-1.

Constituent, ppm	5-28-81	12-11-81	4-20-82	4-19-83	11-23-83
Calcium	7.5	8.5	8.5	10.0	9.0
Magnesium	0.10	0.25	0.23	0.59	0.44
Sodium	33.0	30.0	29.0	33.0	40.0
Potassium	7.0	7.9	7.1	7.1	8.8
Hydroxide	...	...	0.0	0.0	0.0
Carbonate	0.0	0.0	0.0	0.0	0.0
Bicarbonate	9.5	26.0	11.3	1.7	6.9
Chloride	3.2	13.8	<1.8	2.1	2.1
Sulfate	86.0	104.0	84.0	100.0	120.0
Nitrate	<0.4	0.9	<0.4	<0.4	<0.4
Fluoride	0.49	0.33	0.36	0.41	0.64
Iron	0.82	2.50	1.55	1.3	1.1
Manganese	0.10	0.17	0.09	0.16	0.09
Arsenic	0.01	<0.01	0.02	0.22	<0.01
Copper	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.06	0.03	0.02	0.03	0.01
Total dissolved solids	207.0	266.0	181.0	228.0	293.0
Mercury	<0.0002	<0.0002	0.0002	<0.0002	<0.0002
Nitrite	0.006	0.003	0.005	<0.001	<0.01
Lithium	0.08	0.80	0.02	0.05	0.03
Silica	56.0	66.0	39.0	70.0	120.0
Aluminum	1.1	1.3	<0.1	<0.1	<0.1
Boron	0.6	0.70	0.10	0.12	0.40
Phosphate	0.6	<0.1	<0.1	<0.1	<0.1
Bromide	<0.1	<0.1	<0.1	<0.1	<0.1
Ammonium	3.40	2.9	2.3	2.5	3.4
Electrical conductivity, K x 10 ⁶	450.0	270.0	260.0	370.0	310.0
pH value	8.0	4.5	7.1	6.7	5.5

TABLE 21. Chemical Analysis of Coso Well 2.

Constituent, ppm	4-9-81	12-11-81	11-23-83
Calcium	50.0	65.0	42.0
Magnesium	4.6	6.9	3.4
Sodium	1025.0	1550.0	1450.0
Potassium	75.0	150.0	140.0
Hydroxide	...	...	0.0
Carbonate	59.6	0.0	0.0
Bicarbonate	96.2	213.1	213.0
Chloride	1536.4	2499.2	2241.0
Sulfate	90.0	50.0	75.0
Nitrate	4.0	2.7	3.5
Fluoride	1.2	3.9	3.3
Iron	0.20	0.14	0.12
Mangamese	0.10	1.80	0.24
Arsenic	0.57	5.00	2.0
Copper	<0.01	0.02	0.01
Zinc	0.01	0.43	1.1
Total dissolved solids	3033.0	4693.0	4347.0
Mercury	0.0003	0.024	0.0087
Nitrite	...	0.006	<0.01
Lithium	7.0	12.0	14.0
Silica	51.0	110.0	122.0
Aluminum	<0.1	<0.1	<0.1
Boron	29.0	18.0	34.0
Phosphate	1.4	1.1	2.8
Bromide	2.10	4.5	5.0
Ammonium	<0.01	0.4	<0.1
Electrical conductivity, K x 10 ⁶	5400.0	8000.0	7400.0
pH value	8.9	7.2	7.3

TABLE 22. Comparison of Electrical
Balances in Wells.

Analysis	Well	Dates
Good	4K-1	5-28-81, 4-20-82, 4-19-83, 11-23-83
	4P-1	5-28-81, 12-11-81, 4-20-82, 11-23-83
	Coso 1	5-28-81, 4-20-82, 4-19-83, 12-23-83
	Coso 2	4-9-81, 12-11-81, 11-23-83
Fair	4P-1	4-19-83
	Coso 1	12-11-81
Poor	4K-1	12-11-81
	Coso 2	11-23-83

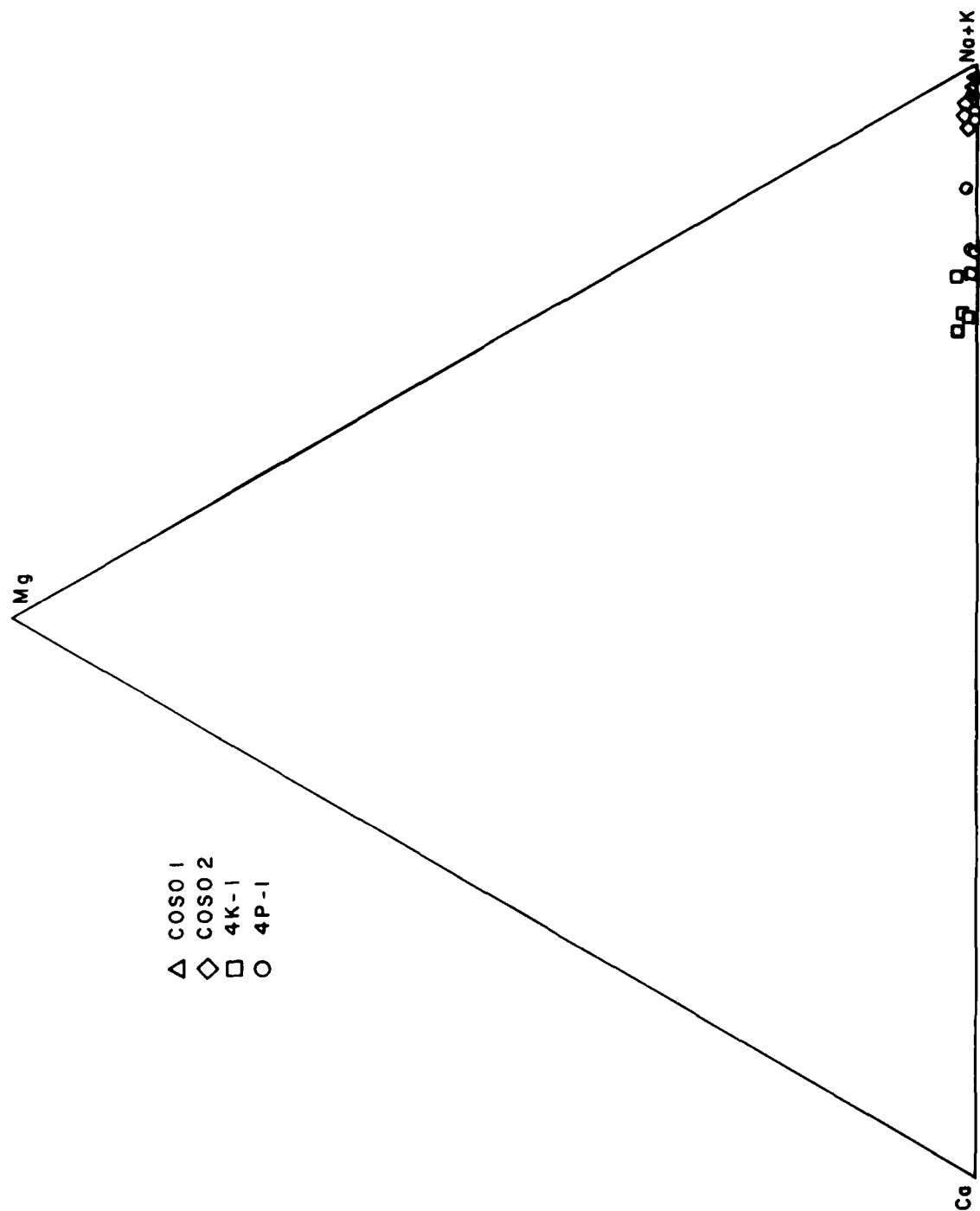


FIGURE 48. Ternary Diagram of Well Fluids in a Calcium-Sodium/Potassium-Magnesium System.

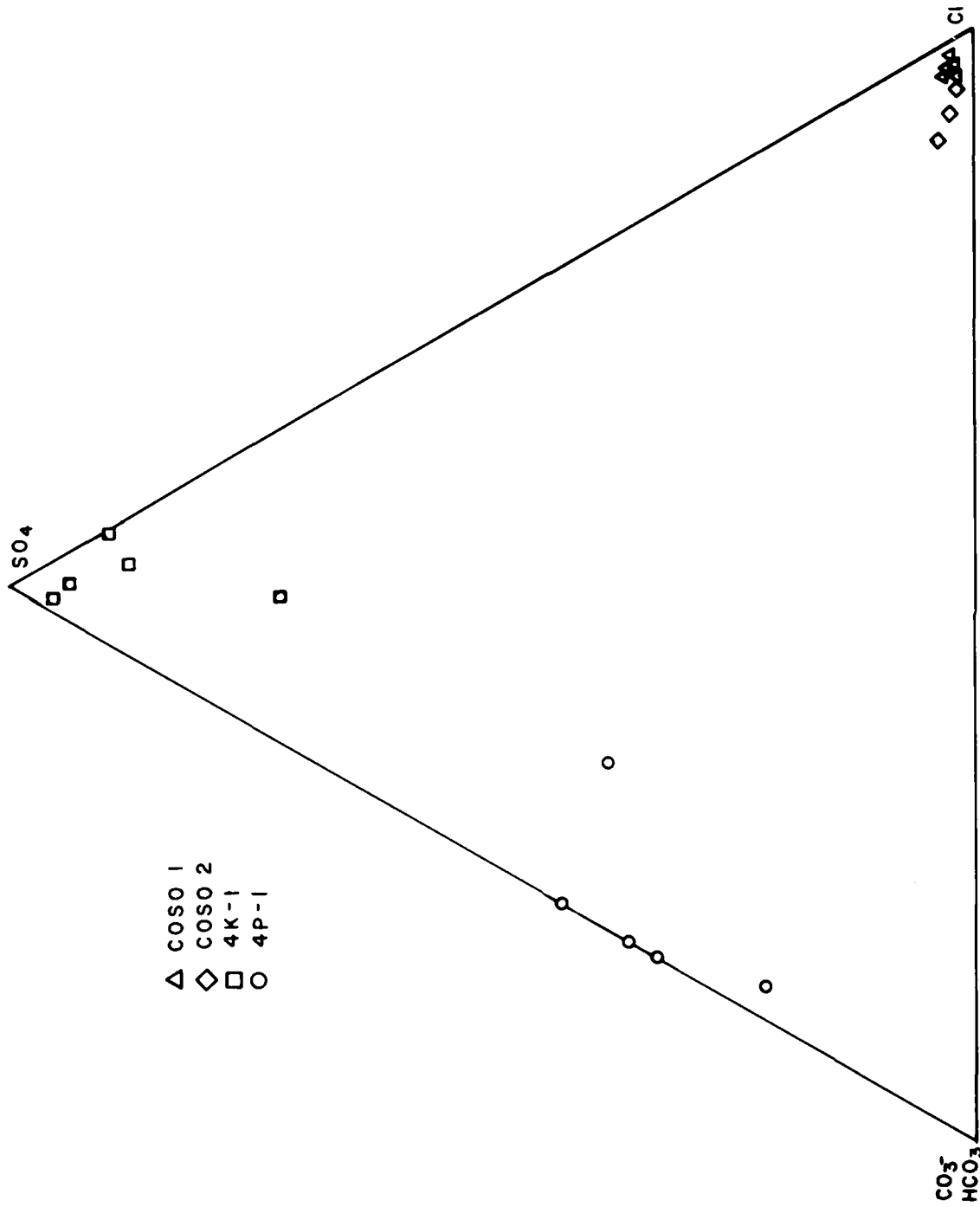


FIGURE 49. Ternary Diagram of Well Fluids in a Sulfate-Carbonate/Bicarbonate-Chloride System.

Coso 1 best represents the geothermal reservoir because the quartz and sodium-potassium-calcium geothermometers are concordant with actual reservoir temperatures to the west. The data are in accord with data from earlier (1980) work by Fournier and others who indicated that the temperatures for reservoir waters feeding Coso Well 1 were about 240 to 250°C (Reference 7). Geothermometric determinations for the present water samples are given in Table 23. It appears that there may be a decimal point error in the manganese results of the 5-28-81 sampling; the reported value appears to be ten times too high. This is also true for the iron, zinc, and phosphate results on the same sampling.

Of special note is the arsenic content (7.8 to 18.5 ppm). U.S. Public Health Department drinking water standards (1961) list a recommended maximum of 0.05 ppm arsenic in drinking water (Reference 8).

Coso Well 2 water appears to be leakage from the Coso Hot Springs fault with a slight ground water contamination. The largest change is a drop in silica content, probably caused by the precipitation of opal. Manganese on the 12-11-81 sampling may be high by an order of magnitude. Arsenic on the 4-9-81 sampling may be low by an order of magnitude. Zinc, mercury, and ammonia results are so erratic that a baseline value cannot be established.

Well 4P-1 water represents condensed steam. Dominant cations are sodium and potassium but the presence of some calcium indicates slight contamination by ground water or local solution of calcite in the alluvium by the condensate. Carbonate, bicarbonate, and sulfate are the dominant anions. The chlorine, lithium, and boron analyses of 5-28-81 appear high. The mercury analyses are erratic.

The water in Well 4K-1 is also condensed steam. It is generally similar to the water in Well 4P-1 but contains much less carbonate and bicarbonate. Chlorine results on the 12-11-81 sampling, arsenic results on the 4-19-83 sampling, and lithium results on the 12-11-81 sampling appear to be high by an order of magnitude.

TEMPERATURE LOGS OF COSO RESORT AREA WELLS

Temperature logs of Coso Well 1, 4K-1, and 4P-1 are shown in Figures 50, 51, and 52, respectively. Discontinuity between the curves, especially between the 1981 and later year curves, results from electrical variability in the earlier logging equipment that made accurate calibration difficult. Two different logging units were used in 1983. The first was a unit built at NWC; the other was built by Enviro-Labs, Inc., Glendale, Calif. The temperature curves from the two units compare closely, indicating that the data are good and the resulting curves are real.

TABLE 23. Geothermometric Determinations From the Water Chemistry of the Observation Wells.

Well	Sample date	Formation temperature, °C		
		SiO ₂ conductive cooling	SiO ₂ steam flashing	Na-K-Ca
Coso 1	5-28-81	216	199	268
	12-11-81	229	209	250
	4-20-82	216	198	255
	4-19-83	234	213	263
	11-23-83	242	219	269
	Average temperature	227	208	261
Coso 2	4-9-81	103	105	188
	12-11-81	143	138	210
	11-23-83	149	143	213
	Average temperature	132	129	204
4P-1	5-28-81	165	157	149
	12-11-81	167	158	143
	4-20-82	165	167	127
	4-19-83	167	159	120
	11-23-83	189	177	142
	Average temperature	171	164	136
4K-1	5-28-81	107	108	97
	12-11-81	115	115	97
	4-20-82	91	94	93
	4-19-83	118	118	91
	11-23-83	148	143	103
	Average temperature	116	116	96

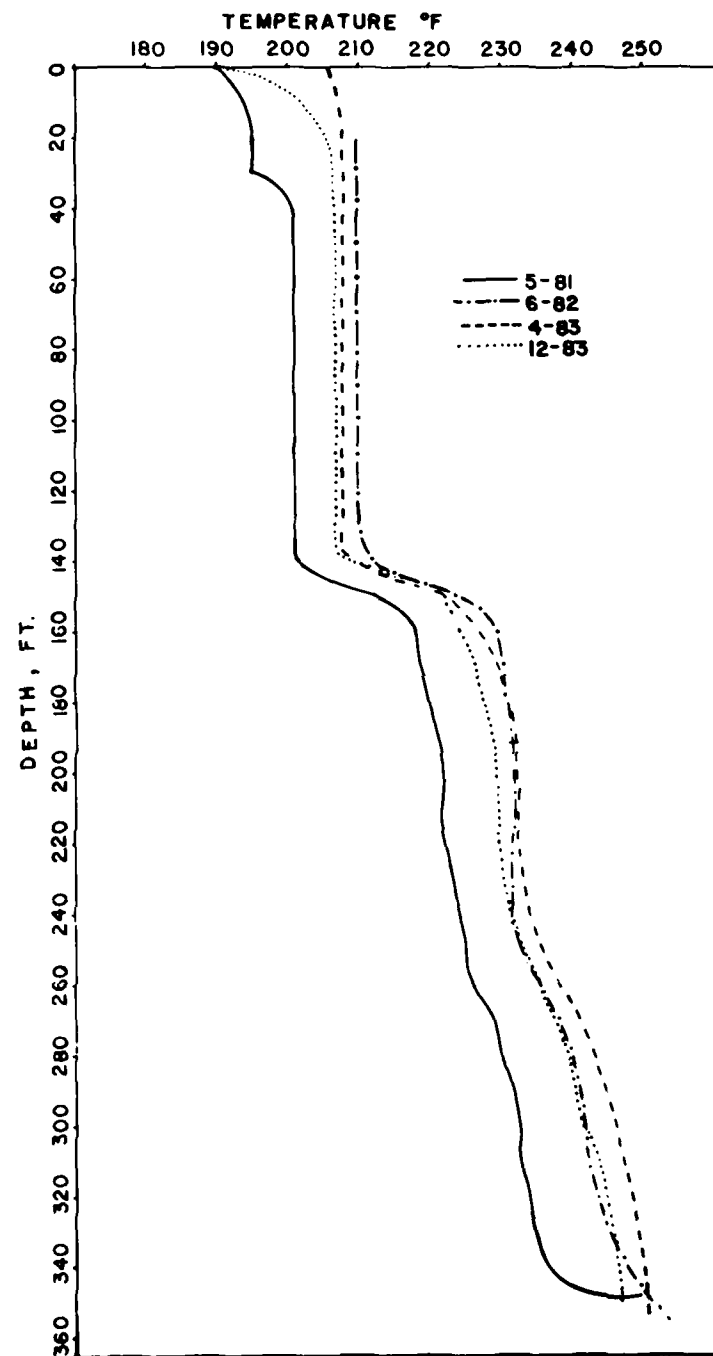


FIGURE 50. Temperature Log Versus Depth, Coso Well 1.

AD-A147 894

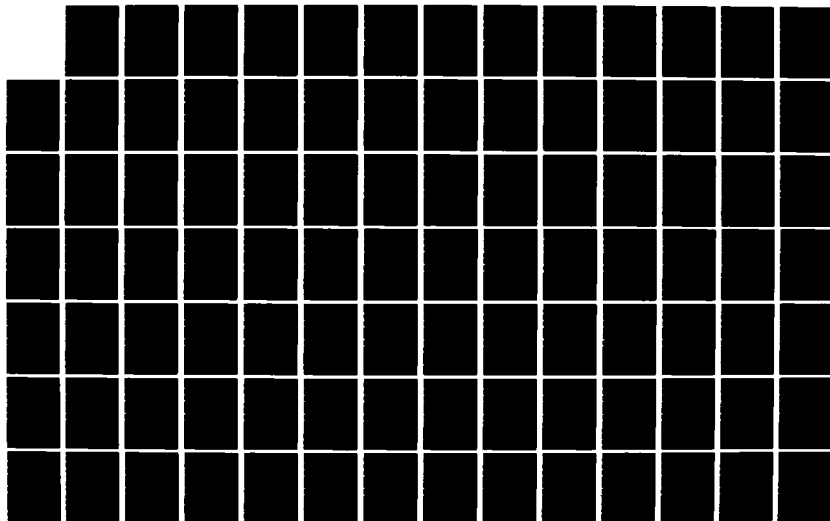
COSO MONITORING PROGRAM JANUARY 1981 THROUGH DECEMBER
1983(U) NAVAL WEAPONS CENTER CHINA LAKE CA
S C BJORNSTAD ET AL. SEP 84 NWC-TP-6558

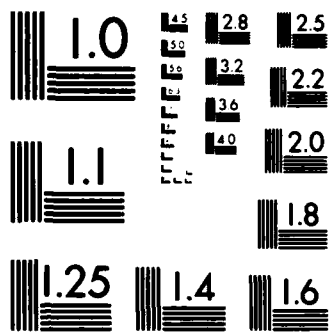
2/3

UNCLASSIFIED

F/G 8/8

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

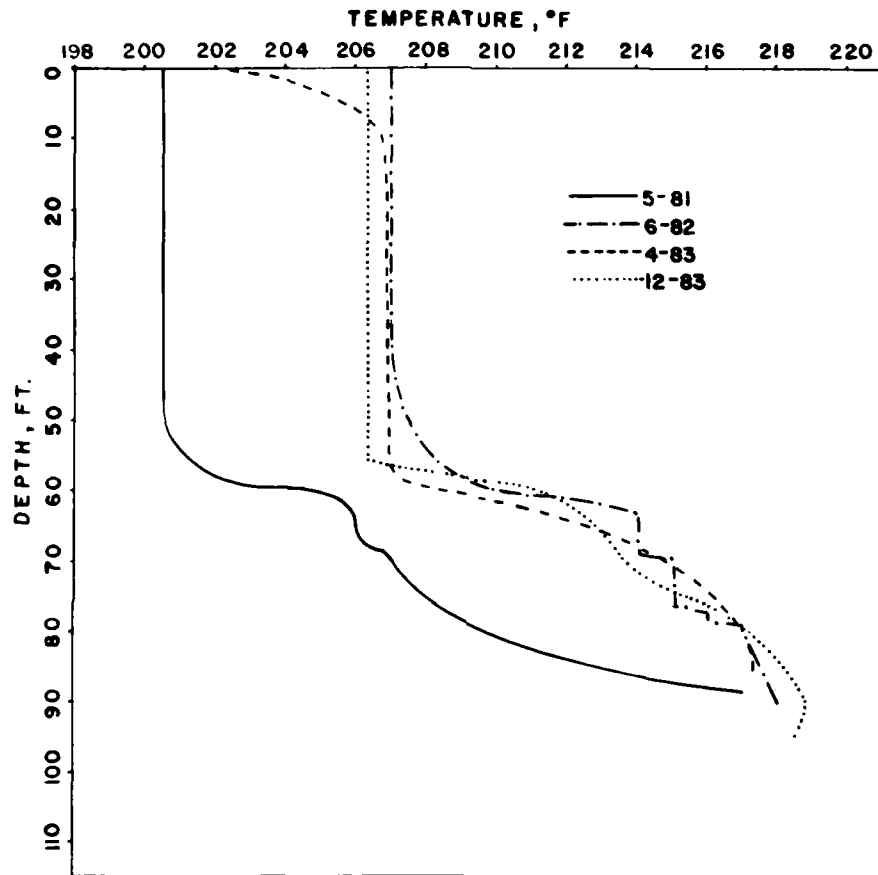


FIGURE 51. Temperature Log Versus Depth, Well 4K-1.

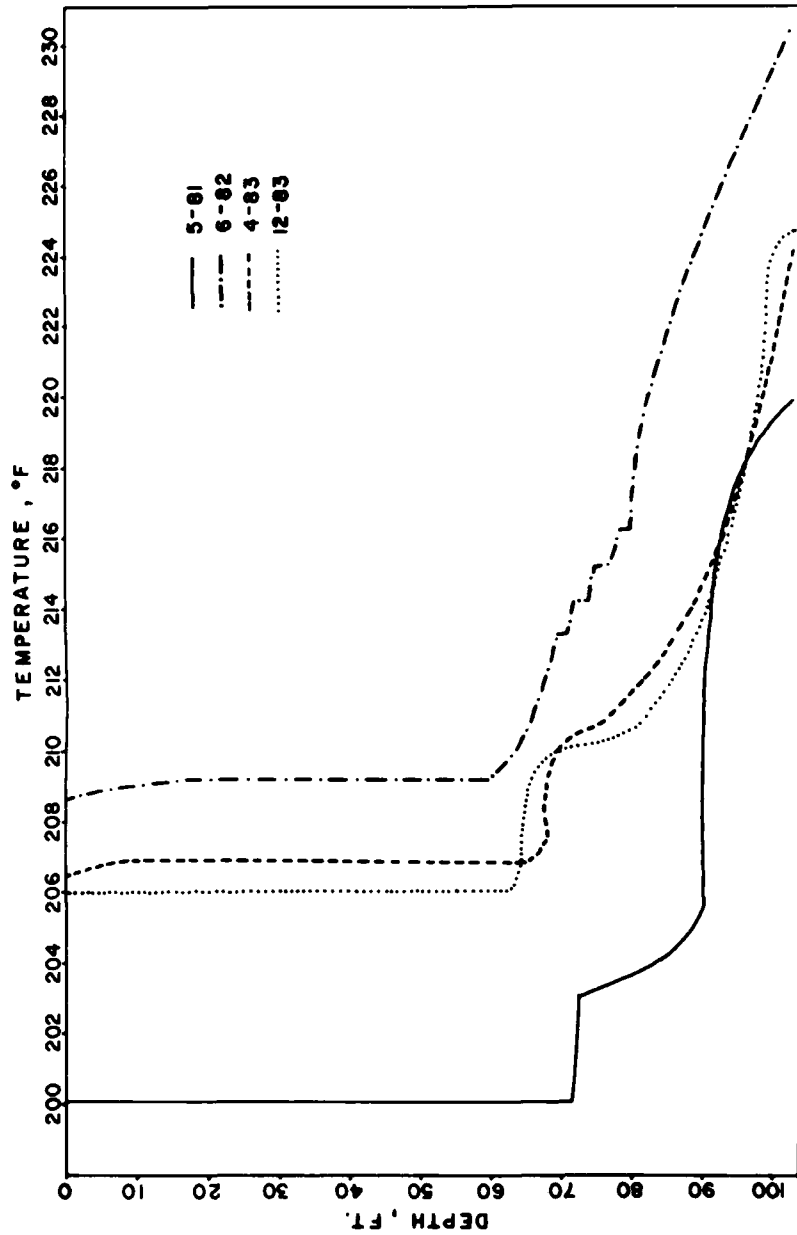


FIGURE 52. Temperature Log Versus Depth, Well 4P-1.

Thermal gradients calculated from the 1983 temperature curves beneath the water table are

Coso Well 1: 19.0°F/100 feet

Well 4K-1: 31.5°F/100 feet

Well 4P-1: 54.1°F/100 feet

Temperature log data are given for the various years and sites in Appendix Tables C-1 through C-5.

SUMMARY AND RECOMMENDATIONS

The Devils Kitchen steam flow continues to be the most consistent of the flows being monitored. A decrease in the flow from 1978 through 1981 reversed itself for the last 2 years. The decrease was thought to indicate a deterioration of the collector, but it now appears that this magnitude of fluctuation is natural.

The Coso Corrosion Array steam flow continued to show wide fluctuation in flow rate even after the lines were insulated. This, coupled with the apparent smooth rate of change, indicates that these fluctuations are natural at this site. The manifold valves on the corrosion array downstream of the recorder need to be kept open so that the recorder will not be affected by back pressure.

No problems are indicated at the Two-Inch Steam Well, and no alterations to the monitoring at this site are anticipated.

The Eight-Inch "Stove Pipe" Well is the most troublesome of all the monitored sites, primarily because condensate blockage of the meter lines continued to be a problem. The lines were reconfigured late in 1983, and additional work may be required if reconfiguration does not solve the problem.

Reconfiguration of the meter piping was also necessary at the Schober's Resort site, as was a change in the water column part of the meter. Since the changes were made, the data have been in good agreement with the manual pressure reading obtained with a manometer.

The photographic investigation continues to be the centerpiece of the monitoring program because it so graphically illustrates the effects that seasonal and climatic variables have on the hot pools.

The water level monitoring is giving good data at all sites except Coso Well 1. Because of the degassing that occurs in the well, the float-activated water-level recorder continues to give unreliable data (except the weekly manual recording). We are again recommending that continuous reading, downhole pressure sensor-type water-level recorders be considered for the three open-hole wells (Coso 1, 4P-1, and 4K-1).

Examination of the water analyses performed over the 3-year period reveals that the wells represent different parts of the hydrologic system at Coso and that, within a range, the concentration of different fluid constituents is consistent. At the present time variations in these concentrations are thought to be primarily analytical, particularly in the trace element analyses. It is believed that some trends may be developing, but this will be addressed in subsequent reports as more data become available.

REFERENCES

1. Naval Weapons Center. *Coso Monitoring Program, 1978 - December 1979*, by C. R. Rodgers, J. R. Neffew, K. J. Danti, and E. M. Edwards. China Lake, Calif., NWC, July 1980. 74 pp. (NWC TP 6195, publication UNCLASSIFIED.)
2. ----- . *Coso Monitoring Program, January Through December 1980*, by C. R. Rodgers, E. M. Edwards, and D. L. Bowles. China Lake, Calif., NWC, December 1981. 112 pp. (NWC TP 6314, publication UNCLASSIFIED.)
3. Advisory Council On Historic Preservation. "Programmatic Memorandum of Agreement Between the Commander, Naval Weapons Center, California State Historic Preservation Officer, Advisory Council On Historic Preservation." Washington, D.C., ACOHP, 26 December 1979.
4. Naval Weapons Center. *Hydrogeologic Investigation of Coso Hot Springs, Inyo County, California*, by Frank A. Spane, Jr., Hydro-Search, Inc. China Lake, Calif., NWC, May 1978. (NWC TP 6025, publication UNCLASSIFIED.)
5. Lofgren, Ben E. Possible Impact of Geothermal Developments on the Hydrologic Regime of the Coso Geothermal Area, 1984. Prepared for California Energy Co: Woodward-Clyde Consultants, Sacramento, Calif.
6. Naval Weapons Center. *Coso Geothermal Corrosion Studies*, by Stephen A. Finnegan. China Lake, Calif., NWC, October 1977. 86 pp. (NWC TP 5974, publication UNCLASSIFIED.)
7. Fournier, R. O., and others. "Interpretation of Chemical Analysis of Waters Collected From Two Geothermal Wells at Coso, California," in *Journal of Geophysical Research*, Vol. 85, No. B5, 10 May 1980, pp. 2405-10.
8. Hem, John D. *Study and Interpretation of the Chemical Characteristics of Natural Water*. U.S. Geological Survey, 1970. 363 pp. (Water Supply Paper No. 1473.)

NWC TP 6558

Appendix A

DAILY STEAM FLOW DATA

TABLE A-1. Steam Flows in Pounds per Hour (pph) At Devils Kitchen Corrosion Array Site for 1981 Through 1983.

January										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	...	356.0	...	362.1	359.1	...	350.0	...	354.0	352.0
2	364.1	356.0	...	362.1	359.1	359.4	350.0	...	350.0	350.0
3	366.5	354.0	...	362.1	358.1	359.8	350.0	...	354.0	352.0
4	364.9	356.0	360.1	362.1	359.4	360.0	350.0	356.0	354.0	353.3
5	366.5	356.0	364.1	358.0	359.4	362.3	350.0	356.0	350.0	352.0
6	368.6	354.0	362.1	366.1	360.7	361.9	352.0	354.0	354.0	353.3
7	364.5	358.1	362.1	358.0	359.4	359.4	350.0	354.0	350.0	351.3
8	364.5	356.0	364.1	358.0	359.4	357.0	350.0	356.0	350.0	353.3
9	371.6	356.0	362.1	358.0	358.7	360.4	350.0	346.0	350.0	348.7
10	374.7	354.0	350.0	358.0	354.0	368.6	350.0	339.9	346.0	345.3
11	380.4	354.0	358.1	358.0	356.7	375.1	350.0	364.1	354.0	356.0
12	379.4	354.0	362.1	358.0	358.0	370.6	350.0	348.0	350.0	349.3
13	376.8	354.0	354.0	358.0	355.3	370.6	350.0	346.0	350.0	348.7
14	381.2	354.0	362.1	358.0	358.0	374.7	350.0	354.0	350.0	351.3
15	380.4	358.1	358.1	362.1	359.4	372.7	352.0	352.0	354.0	352.7
16	378.8	354.0	358.1	362.1	358.1	362.5	350.0	350.0	354.0	351.3
17	378.8	352.0	364.1	362.1	359.4	368.6	350.0	358.1	350.0	352.7
18	374.7	354.0	362.1	362.1	359.4	362.5	346.0	358.1	354.0	352.7
19	368.6	358.1	362.1	362.1	360.8	358.4	352.0	354.0	350.0	352.0
20	365.6	354.0	368.1	354.0	358.7	357.6	350.0	358.1	350.0	352.7
21	374.3	354.0	362.1	354.0	365.7	364.1	348.0	348.0	350.0	348.7
22	374.3	356.0	346.0	362.1	354.7	361.9	352.0	342.0	350.0	348.0
23	372.2	358.1	354.0	358.0	356.7	365.6	354.0	346.0	350.0	350.0
24	377.8	358.1	350.0	366.1	358.1	370.6	352.0	358.1	358.0	356.0
25	...	358.1	362.1	370.1	363.4	...	350.0	354.0	354.0	352.7
26	...	358.1	354.0	362.1	358.1	...	354.0	350.0	350.0	351.3
27	...	358.1	366.1	366.1	363.4	...	354.0	354.0	354.0	354.0
28	...	358.1	354.0	362.1	358.1	...	354.0	344.0	354.0	350.7
29	...	358.1	354.0	...	356.0	...	354.0	346.0	...	350.0
30	...	354.0	360.1	...	357.0	...	350.0	352.0	...	351.0
31	...	352.0	...	362.1	357.0	...	348.0	...	...	348.0
Mean	372.6	355.7	359.1	360.8	358.4	364.5	351.0	351.8	351.7	351.3

TABLE A-1. (Contd.)

February										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	...	352.0	358.1	362.1	357.4	...	348.0	350.0	358.1	352.0
2	...	354.0	358.1	366.1	359.4	...	352.0	350.0	358.1	353.4
3	...	358.1	366.1	362.1	362.1	...	354.0	358.1	358.1	356.7
4	...	356.0	362.1	358.1	358.7	...	352.0	348.0	354.0	351.3
5	...	358.1	350.0	358.1	355.4	...	354.0	346.0	354.0	351.3
6	...	358.1	356.0	358.1	357.4	...	354.0	348.0	350.0	350.7
7	...	356.0	362.1	362.1	360.1	...	350.0	356.0	354.0	353.3
8	...	358.1	360.1	358.1	358.8	...	354.0	354.0	358.1	355.4
9	...	354.0	362.1	358.1	358.1	...	350.0	356.0	350.0	352.0
10	...	352.0	358.1	358.1	356.1	...	346.0	354.0	350.0	350.0
11	...	354.0	354.0	358.1	355.4	...	350.0	346.0	350.0	338.7
12	...	352.0	354.0	358.1	354.7	...	348.0	348.0	354.0	350.0
13	371.0	354.0	362.1	362.1	359.4	365.9	350.0	354.0	354.0	352.7
14	373.6	358.1	362.1	358.1	359.4	362.3	352.0	356.0	354.0	354.0
15	...	358.1	362.0	358.1	359.4	...	301.7	354.0	350.0	335.2
16	370.6	358.1	362.1	370.1	363.4	360.9	352.0	352.0	354.0	352.7
17	369.9	356.0	362.1	358.1	358.7	362.3	350.0	352.0	350.0	350.7
18	374.6	352.0	356.0	358.1	355.4	365.9	348.0	350.0	350.0	349.3
19	372.6	360.1	356.0	358.1	358.1	366.3	352.0	350.0	350.0	350.7
20	372.4	358.1	356.0	362.1	358.7	363.3	350.0	350.0	354.0	351.3
21	369.8	352.0	356.0	362.1	356.7	360.3	348.0	354.0	354.0	352.0
22	...	356.0	362.1	358.1	358.7	...	350.0	356.0	354.0	353.3
23	364.9	364.1	356.0	362.1	360.7	359.8	356.0	352.0	354.0	354.0
24	369.2	362.1	360.1	366.1	362.8	362.9	356.0	354.0	358.1	356.0
25	371.4	358.1	356.0	366.1	360.1	362.7	354.0	350.0	358.1	354.0
26	372.7	358.1	360.1	358.1	358.8	363.7	350.0	350.0	354.0	351.3
27	370.6	358.1	354.9	358.1	356.7	362.4	354.0	348.0	350.0	350.7
28	374.2	358.1	352.0	358.1	356.1	365.7	354.0	346.0	354.0	351.3
29	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
Mean	371.3	356.5	358.2	360.4	358.4	363.1	338.4	351.5	353.6	347.8

TABLE A-1. (Contd.)

March										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	377.7	360.1	358.0	362.1	360.1	366.5	356.0	354.0	354.0	354.7
2	370.6	362.1	362.1	...	362.1	364.1	356.0	354.0	...	355.0
3	367.7	362.1	358.1	...	360.1	359.9	321.8	350.0	...	335.9
4	372.7	362.1	358.0	...	360.1	362.5	321.8	350.0	...	335.9
5	371.1	366.1	354.0	...	360.1	363.9	360.1	346.0	...	353.1
6	369.9	362.1	358.0	...	360.1	361.0	354.0	346.0	...	350.0
7	372.6	354.0	358.0	...	356.0	364.5	352.0	350.0	...	351.0
8	375.7	354.0	358.0	...	356.0	370.6	352.0	346.0	...	349.0
9	376.7	354.0	358.0	...	356.0	366.5	352.0	354.0	...	353.0
10	370.4	362.1	362.1	...	362.1	364.6	354.0	358.0	...	356.0
11	371.9	362.1	362.1	...	362.1	365.4	354.0	358.1	...	356.0
12	370.7	356.0	358.1	...	357.1	362.5	354.0	354.0	...	354.0
13	370.4	360.1	362.1	...	361.1	359.9	354.0	354.0	...	354.0
14	369.1	354.0	...	...	354.0	362.3	350.0	...	...	350.0
15	372.3	362.1	358.1	...	360.1	362.3	350.0	354.0	...	352.0
16	367.8	358.1	358.1	...	358.1	361.1	350.0	354.0	...	352.0
17	371.1	362.1	362.1	...	362.1	362.3	350.0	358.1	...	354.1
18	376.5	360.1	358.1	...	359.1	365.5	352.0	350.0	...	351.0
19	370.2	366.1	...	...	366.1	363.7	356.0	...	...	356.0
20	370.7	364.0	...	...	364.0	363.7	356.0	...	...	356.0
21	373.7	354.0	...	370.1	362.1	366.7	346.0	...	362.1	354.1
22	369.1	354.0	...	366.1	360.1	363.1	348.0	...	358.1	353.1
23	369.1	356.0	362.1	370.1	362.7	361.4	352.0	354.0	354.0	353.3
24	369.7	354.0	362.1	370.1	362.1	360.7	348.0	354.0	366.1	356.0
25	372.1	352.1	362.0	366.1	360.1	365.5	352.0	354.0	354.0	353.3
26	373.2	366.1	362.1	362.1	363.4	366.7	358.1	354.0	354.0	355.4
27	369.1	356.0	366.1	366.1	362.7	363.0	350.0	358.1	362.1	356.7
28	371.5	358.1	362.1	362.1	360.8	362.3	350.0	354.0	358.1	354.0
29	366.8	362.1	370.1	362.1	364.8	357.6	354.0	362.1	354.0	356.7
30	373.1	333.9	360.1	366.1	353.4	360.4	330.0	354.0	358.1	347.4
31	376.1	358.1	358.1	366.1	360.8	365.3	330.0	350.0	358.1	346.0
Mean	371.6	358.6	358.4	365.8	360.9	363.4	349.2	351.7	357.1	352.7

TABLE A-1. (Contd.)

April										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	372.2	362.1	366.1	366.1	364.8	366.4	356.0	354.0	354.0	354.7
2	369.4	362.1	...	374.1	368.1	360.7	354.0	...	362.1	358.1
3	365.9	352.0	...	366.1	359.1	359.4	356.0	...	362.1	359.1
4	376.5	327.9	...	366.1	347.0	363.2	339.9	...	358.1	349.0
5	370.6	358.1	366.1	362.1	362.1	363.7	346.0	354.0	354.0	351.3
6	372.4	364.1	362.1	366.1	364.1	365.1	358.1	358.1	358.1	358.1
7	367.1	362.1	358.1	362.1	360.8	360.6	354.4	350.0	358.1	354.2
8	368.0	354.8	362.1	366.1	361.0	359.8	350.0	350.0	358.1	352.7
9	372.5	358.9	358.1	370.1	362.4	362.4	350.0	354.0	358.1	354.0
10	369.2	358.9	358.1	366.1	361.0	361.7	353.2	354.0	362.1	356.4
11	369.1	354.8	362.1	366.1	361.0	362.1	349.2	354.0	358.1	353.8
12	366.4	354.8	362.1	358.1	358.3	362.1	350.4	354.0	354.0	352.8
13	372.6	353.6	362.1	362.1	359.3	366.5	346.4	354.0	354.0	351.5
14	371.8	...	362.1	362.1	362.1	363.4	...	354.0	354.0	354.0
15	371.8	354.0	356.0	...	355.0	362.3	350.0	354.0	...	352.0
16	369.9	358.1	354.0	...	356.1	361.0	350.0	348.0	...	349.0
17	367.7	358.1	358.0	...	358.0	361.3	354.0	350.0	...	352.0
18	368.0	358.1	358.0	362.1	359.4	361.0	350.0	350.0	354.0	351.3
19	369.1	352.0	358.0	370.1	360.0	361.9	348.0	352.0	358.1	352.7
20	369.4	354.0	356.0	370.1	360.0	363.3	346.0	348.0	362.1	352.0
21	368.4	356.0	356.0	358.1	356.7	360.6	350.0	348.0	354.0	350.7
22	365.6	354.0	358.0	362.1	358.0	359.8	346.0	354.0	354.0	348.3
23	367.7	356.0	362.1	366.1	361.4	360.7	350.0	354.0	358.1	354.0
24	366.5	362.1	362.1	366.1	363.4	361.8	354.0	354.0	358.1	355.4
25	366.7	360.1	362.1	366.1	362.8	361.7	354.0	354.0	362.1	356.7
26	367.6	358.1	360.1	366.1	361.4	361.7	350.0	352.0	358.1	350.0
27	366.3	350.0	358.0	362.1	356.7	359.9	346.0	350.0	354.0	352.7
28	368.6	354.0	362.1	366.1	360.7	362.5	346.0	354.0	358.1	352.9
29	369.2	356.0	358.0	366.1	360.0	350.1	348.0	350.0	358.1	352.0
30	371.3	358.1	...	362.1	360.1	353.5	350.0	...	358.1	354.1
31	...	...	...	...	...	...	...	...	...	...
Mean	369.3	356.0	358.6	364.9	359.8	361.3	350.2	351.6	357.5	353.1

TABLE A-1. (Contd.)

May										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	367.8	362.1	...	...	362.1	358.3	354.0	...	...	354.0
2	365.1	362.1	...	...	362.1	356.9	358.1	...	...	358.1
3	367.1	356.0	358.0	358.1	357.4	358.2	352.0	354.0	350.0	352.0
4	372.7	354.0	356.0	366.1	358.7	362.5	350.0	350.0	354.0	351.3
5	370.4	356.0	354.0	370.1	360.0	362.3	350.0	346.0	362.1	352.7
6	369.1	354.0	356.0	366.1	358.7	362.3	356.0	346.0	362.1	354.7
7	367.7	354.0	364.1	358.0	358.7	358.3	350.0	354.0	350.0	351.3
8	367.0	352.0	362.1	366.1	360.1	358.3	346.0	358.0	354.0	352.7
9	366.4	354.0	360.1	370.1	361.4	360.3	346.0	350.0	358.1	351.4
10	365.0	362.1	354.0	370.1	362.1	356.9	354.0	350.0	350.1	351.4
11	363.7	356.0	354.0	358.1	356.0	355.5	352.0	350.0	354.0	352.0
12	363.7	358.1	...	366.1	362.1	355.6	350.0	...	354.0	352.0
13	367.1	358.1	...	362.1	360.1	359.6	350.0	...	354.0	352.0
14	367.7	362.1	...	362.1	362.1	363.7	354.0	...	350.0	352.0
15	369.1	362.1	...	366.1	364.1	361.0	354.0	...	358.1	356.0
16	363.7	356.0	...	354.0	355.0	358.3	356.0	...	362.1	359.0
17	364.4	350.0	356.0	362.1	356.0	355.6	356.0	348.0	354.0	352.7
18	366.5	354.0	360.1	362.1	358.7	362.5	354.0	352.0	350.0	352.0
19	370.6	356.0	358.0	366.1	369.0	362.5	352.0	350.0	354.0	352.0
20	365.6	354.0	354.0	366.1	358.0	362.5	346.0	346.0	354.0	348.7
21	367.8	350.0	356.0	366.1	357.4	360.4	346.0	348.0	350.0	348.0
22	369.1	350.0	358.0	370.1	359.4	361.0	348.0	352.0	358.1	352.7
23	367.7	354.0	358.0	370.1	360.7	359.6	350.0	352.0	358.1	353.4
24	365.1	358.1	360.1	...	359.1	358.3	350.0	350.0	...	350.0
25	365.1	...	360.1	...	360.1	358.3	...	354.0	...	354.0
26	365.0	356.0	360.1	...	358.0	358.3	350.0	354.0	...	352.0
27	366.4	352.0	360.1	...	356.0	358.3	348.0	350.0	...	349.0
28	365.7	356.0	356.0	...	356.0	358.3	350.0	346.0	...	348.0
29	367.1	358.1	358.0	...	358.0	358.3	350.0	350.0	...	350.0
30	367.8	360.1	352.0	...	356.1	361.0	354.0	346.0	...	350.0
31	366.4	358.1	...	370.1	364.1	358.3	354.0	...	362.1	358.0
Mean	367.0	356.2	357.6	365.2	359.7	359.4	351.3	350.3	354.8	352.1

TABLE A-1. (Contd.)

June										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	366.4	362.0	354.0	366.1	360.7	361.0	321.8	348.0	358.1	342.6
2	368.4	364.1	356.0	354.0	358.0	361.0	354.0	350.0	329.9	344.6
3	367.1	358.1	354.0	362.1	358.1	358.3	350.0	348.0	354.0	350.7
4	365.0	356.0	356.0	362.1	358.0	359.0	350.0	352.0	350.0	350.7
5	367.8	362.0	...	362.1	362.1	360.3	354.0	...	354.0	354.0
6	368.4	358.1	...	362.1	360.1	359.0	354.0	...	354.0	354.0
7	366.4	...	...	366.1	366.1	358.2	...	...	358.1	358.1
8	366.4	...	356.0	362.1	359.1	358.3	...	350.0	358.1	354.1
9	367.8	362.0	356.0	362.1	360.0	359.6	354.0	350.0	354.0	352.7
10	369.1	364.1	356.0	366.1	362.1	361.0	354.0	350.0	354.0	352.7
11	366.4	362.0	360.1	358.1	360.1	359.7	354.0	352.0	356.0	354.0
12	366.4	360.1	362.1	362.1	361.4	359.7	354.0	356.0	350.0	353.3
13	369.1	358.1	362.1	366.1	362.1	361.0	354.0	356.0	358.1	356.0
14	367.8	358.1	358.0	362.1	359.4	362.3	348.0	354.0	354.0	352.0
15	368.4	354.0	358.0	366.1	359.4	361.0	346.0	350.0	358.1	351.4
16	369.1	360.1	362.1	366.1	362.8	362.3	350.0	352.0	358.1	353.4
17	366.4	362.0	360.1	366.1	362.7	359.6	354.0	350.0	354.0	352.7
18	366.4	358.1	358.1	358.1	358.1	355.5	350.0	350.0	358.1	352.7
19	367.8	358.1	...	...	358.1	359.6	350.0	...	...	350.0
20	366.4	360.1	...	366.0	363.1	361.0	354.0	...	358.1	356.1
21	369.1	358.1	...	358.1	358.1	361.0	352.0	...	354.0	353.0
22	367.8	354.0	356.0	362.1	357.4	361.0	354.0	350.0	350.0	351.3
23	367.9	362.0	358.0	366.1	362.0	362.3	354.0	352.0	354.0	353.3
24	367.8	352.0	356.0	362.1	356.7	361.1	350.0	352.0	354.0	352.0
25	366.3	356.0	358.0	366.1	360.0	361.0	350.0	350.0	354.0	351.3
26	367.8	360.1	360.1	362.1	360.8	361.0	350.0	352.0	354.0	352.0
27	367.1	...	362.1	...	362.1	360.9	...	352.0	...	352.0
28	366.4	...	358.0	...	358.0	360.9	...	352.0	...	352.0
29	367.9	356.0	...	...	356.0	360.9	350.0	...	...	350.0
30	369.7	354.0	...	...	354.0	361.7	350.0	...	...	350.0
31	...	...	...	...	...	...	...	...	...	...
Mean	367.5	358.3	358.0	362.9	359.9	360.3	350.62	351.3	353.5	351.8

TABLE A-1. (Contd.)

July										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	367.8	358.1	354.0	...	356.0	361.7	352.0	346.0	...	349.0
2	367.1	354.0	356.0	...	355.0	360.3	350.0	348.0	...	349.0
3	367.1	356.0	360.1	...	358.0	361.7	350.0	350.0	...	350.0
4	367.7	358.1	...	...	358.1	362.3	350.0	...	...	350.0
5	366.4	358.1	...	362.1	360.1	361.7	352.0	...	350.0	351.0
6	366.4	358.1	...	362.1	360.1	359.0	352.0	...	350.0	351.0
7	369.7	358.1	358.1	362.1	359.4	360.3	352.0	350.0	350.0	350.7
8	366.4	354.0	358.1	362.1	358.1	359.0	348.0	350.0	350.0	349.3
9	367.8	358.1	358.1	358.1	358.1	361.7	350.0	350.0	350.0	350.0
10	371.2	358.1	358.1	358.1	358.1	361.7	350.0	350.0	346.0	348.7
11	370.5	354.0	358.1	362.1	358.1	362.3	350.0	350.0	350.0	350.0
12	369.1	...	358.1	362.1	360.1	363.0	...	350.0	350.0	350.0
13	369.1	356.0	360.1	362.1	359.4	361.7	350.0	352.0	350.0	350.7
14	369.1	358.1	362.1	366.1	362.1	361.7	350.0	352.0	354.0	352.0
15	369.1	358.1	360.1	366.1	361.4	362.3	350.0	354.0	358.1	354.0
16	370.5	360.1	358.1	362.1	360.1	361.7	352.0	350.0	354.0	352.0
17	369.8	358.1	356.0	358.1	357.4	362.3	350.0	350.0	350.0	350.0
18	371.8	354.0	356.0	362.1	357.4	363.0	350.0	348.0	350.0	349.3
19	370.5	354.0	358.1	362.1	358.1	359.6	348.0	350.0	350.0	349.3
20	367.8	356.0	358.1	358.1	357.4	361.0	348.0	350.0	350.0	349.3
21	367.8	358.1	356.0	362.1	358.7	359.7	350.0	348.0	350.0	349.3
22	370.6	358.1	358.1	362.1	359.4	360.3	352.0	350.0	350.0	350.7
23	369.1	358.1	358.1	362.1	369.4	362.5	352.0	350.0	350.0	350.7
24	368.4	358.1	356.0	366.1	350.1	358.3	350.0	350.0	354.0	351.3
25	367.1	358.1	356.0	362.1	358.7	359.6	352.0	348.0	354.0	351.3
26	369.1	354.0	358.1	362.1	358.1	361.0	350.0	350.0	354.0	351.3
27	370.5	354.0	356.0	362.1	357.4	363.0	348.0	348.0	350.0	348.7
28	370.5	358.1	358.1	362.1	359.4	361.7	350.0	348.0	350.0	349.3
29	369.1	358.1	356.0	358.1	357.4	362.3	350.0	350.0	350.0	350.0
30	369.1	356.0	356.0	358.1	356.7	361.7	350.0	348.0	350.0	349.3
31	369.8	356.0	358.1	358.1	357.4	362.4	348.0	350.0	350.0	349.3
Mean	368.9	356.8	357.6	361.5	358.6	361.3	350.2	349.6	350.9	350.2

TABLE A-1. (Contd.)

August										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	370.5	...	362.1	362.1	362.1	362.3	...	354.0	354.0	354.0
2	371.1	...	358.1	362.1	360.1	363.7	...	354.0	350.0	352.0
3	371.8	358.1	358.1	362.1	359.4	365.0	350.0	350.0	350.0	350.0
4	371.1	354.0	354.0	362.1	356.7	361.7	350.0	350.0	350.0	350.0
5	368.4	354.0	354.0	358.1	355.4	361.0	348.0	346.0	350.0	348.0
6	367.1	354.0	350.0	...	352.0	360.3	348.0	348.0	...	348.0
7	369.8	358.1	366.1	...	362.1	361.0	350.0	346.0	...	348.0
8	368.4	358.1	...	362.1	360.1	362.3	352.0	...	350.0	351.0
9	369.1	356.0	362.1	354.0	357.4	359.6	350.0	354.0	356.0	353.3
10	368.4	358.1	362.1	358.0	359.4	362.3	350.0	354.0	350.0	351.3
11	368.4	356.0	358.1	358.1	357.4	359.6	348.0	350.0	346.0	348.0
12	370.5	358.1	358.1	358.1	358.1	362.3	342.0	350.0	350.0	347.3
13	367.7	354.0	358.1	358.1	356.7	361.0	348.0	350.0	350.0	349.3
14	367.7	352.0	358.1	362.1	357.4	361.0	346.0	350.0	350.0	348.7
15	367.8	...	354.0	...	354.0	359.0	...	350.0	...	350.0
16	367.8	...	354.0	362.1	358.1	361.7	...	350.0	350.0	350.0
17	366.4	360.1	354.0	...	357.0	359.0	354.0	350.0	...	352.0
18	369.1	356.0	358.1	...	357.0	358.3	350.0	350.0	...	350.0
19	367.1	354.0	354.0	...	354.0	360.3	348.0	350.0	...	349.0
20	365.0	358.1	354.0	...	356.0	359.7	350.0	346.0	...	348.0
21	365.7	358.0	358.1	...	358.1	359.0	352.0	350.0	...	351.0
22	369.1	356.0	358.0	362.1	358.7	361.0	350.0	350.0	350.0	350.0
23	365.7	358.1	354.0	362.1	358.1	359.7	350.0	346.0	350.0	348.7
24	367.8	356.0	...	362.1	359.0	359.7	352.0	...	350.0	351.0
25	370.6	356.0	358.1	362.1	358.7	359.7	350.0	348.0	354.0	350.7
26	366.4	358.1	358.1	366.1	360.8	359.7	350.0	350.0	354.0	351.3
27	367.0	358.1	358.1	366.1	360.8	360.3	352.0	350.0	354.0	352.0
28	370.6	...	354.0	366.1	360.1	359.7	...	350.0	358.1	354.0
29	365.7	...	358.1	366.1	362.1	361.0	...	350.0	358.1	354.0
30	370.6	...	358.1	362.1	360.1	361.0	...	350.0	354.0	352.0
31	367.8	352.0	358.1	366.1	358.7	362.3	346.0	346.0	354.0	348.7
Mean	368.4	356.3	357.2	361.7	358.4	360.7	349.4	349.7	351.2	350.1

TABLE A-1. (Contd.)

September										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	368.6	356.0	354.0	...	355.0	362.5	348.0	346.0	...	347.0
2	368.6	356.0	358.1	...	357.0	362.5	350.0	350.0	...	350.0
3	370.6	354.0	356.0	...	355.0	362.5	346.0	352.0	...	349.0
4	366.4	358.1	342.0	...	350.0	360.3	350.0	348.0	...	349.0
5	365.1	358.1	354.0	...	356.0	360.3	350.0	348.0	...	349.0
6	366.4	350.0	354.0	362.1	355.4	359.6	346.0	348.0	350.0	348.0
7	366.4	348.0	356.0	366.1	356.7	360.5	346.0	348.0	354.0	349.3
8	366.4	350.0	352.0	362.1	354.7	359.0	337.9	348.0	354.0	346.6
9	365.0	356.0	356.0	362.1	358.0	360.3	348.0	348.0	354.0	350.0
10	366.4	354.0	366.1	358.1	359.4	360.3	348.0	339.9	350.0	346.0
11	367.8	352.0	356.0	362.1	356.7	359.6	348.0	346.0	354.0	349.3
12	367.7	354.0	358.1	...	356.0	361.0	350.0	350.0	...	350.0
13	370.6	356.0	354.0	...	355.0	362.5	350.0	348.0	...	349.0
14	368.6	...	...	...	...	360.5	...	...	...	...
15	364.5	354.0	...	...	354.0	360.5	350.0	...	...	350.0
16	368.5	352.0	...	...	352.0	362.5	348.0	...	...	348.0
17	370.6	354.0	...	...	354.0	360.5	346.0	...	...	346.0
18	366.5	356.0	...	...	356.0	358.4	346.0	...	...	346.0
19	366.6	360.1	...	358.1	359.1	358.4	352.0	...	350.0	351.0
20	366.5	358.1	...	362.1	360.1	358.4	352.0	...	350.0	351.0
21	366.5	356.0	354.0	362.1	357.4	362.5	350.0	346.0	354.0	350.0
22	366.5	356.0	354.0	362.1	357.4	360.5	350.0	348.0	354.0	350.7
23	365.0	354.0	356.0	362.1	357.4	359.0	348.0	348.0	354.0	350.0
24	365.0	356.0	354.1	...	355.0	360.3	350.0	348.0	...	349.0
25	366.4	356.0	358.1	...	357.0	359.0	352.0	350.0	...	351.0
26	366.4	...	364.1	...	364.1	358.3	...	358.1	...	358.1
27	366.4	...	360.1	362.1	361.1	360.3	...	350.0	358.1	354.0
28	364.4	356.0	356.0	362.1	358.0	359.0	348.0	348.0	358.1	351.4
29	365.0	352.0	367.1	358.1	359.1	357.6	348.0	346.0	346.0	346.7
30	365.7	350.0	350.0	...	350.0	360.3	346.0	344.0	...	345.0
31	...	...	...	...	...	...	...	...	...	...
Mean	366.7	354.6	355.6	361.5	357.2	360.2	348.3	348.3	352.9	349.8

TABLE A-1. (Contd.)

October										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	364.1	352.0	348.0	...	350.0	358.3	356.0	342.0	...	349.0
2	364.7	358.1	354.0	...	356.0	358.3	352.0	346.0	...	349.0
3	365.1	356.1	356.0	354.0	355.4	359.0	352.0	352.0	350.0	351.3
4	365.1	352.0	358.1	358.1	356.1	359.6	350.0	352.0	350.0	350.7
5	368.6	346.0	350.0	358.1	351.4	360.5	344.0	346.0	350.0	346.7
6	367.8	354.0	356.0	358.1	356.0	360.3	344.0	346.0	350.0	346.7
7	367.8	362.1	362.1	358.1	360.8	361.0	354.0	346.0	354.0	351.3
8	369.1	354.0	350.0	358.1	354.0	362.3	348.0	342.0	354.0	345.0
9	365.0	358.1	352.0	358.1	356.1	359.7	344.0	344.0	350.0	346.0
10	363.7	348.0	356.0	358.1	354.0	358.3	342.0	346.0	350.0	346.0
11	366.4	350.0	354.0	358.1	354.0	361.0	344.0	348.0	346.0	346.0
12	367.8	348.0	352.0	362.1	354.0	363.0	346.0	348.0	354.0	349.3
13	367.1	...	352.0	370.1	361.1	361.0	...	346.0	362.1	354.1
14	364.4	...	352.0	358.1	355.0	359.0	...	346.0	354.0	350.0
15	365.1	...	352.0	358.1	355.0	359.6	...	346.0	354.0	350.0
16	365.0	...	352.0	358.1	355.0	359.6	...	348.0	350.0	349.0
17	363.7	...	360.1	362.1	361.1	358.3	...	352.0	354.0	353.0
18	363.0	...	356.0	358.1	357.1	358.3	...	348.0	354.0	351.0
19	365.1	352.0	352.0	362.1	355.4	361.0	346.0	346.0	354.0	348.7
20	365.0	354.0	352.0	362.1	356.0	359.7	350.0	348.0	354.0	350.7
21	365.1	352.0	350.0	354.0	352.0	356.2	350.0	346.0	350.0	348.7
22	361.0	348.0	350.0	358.1	352.0	356.2	344.0	348.0	350.0	347.3
23	363.0	356.1	354.0	362.1	357.4	355.6	350.0	346.0	354.0	350.0
24	365.0	360.1	354.0	366.1	360.1	359.7	354.0	346.0	354.0	351.3
25	367.1	352.0	354.0	354.0	353.3	360.3	348.0	348.0	342.0	346.0
26	363.7	354.0	354.0	354.0	354.0	356.9	348.0	344.0	346.0	346.0
27	363.0	354.0	348.0	362.1	354.7	356.3	348.0	342.0	350.0	346.7
28	363.7	356.0	352.0	362.1	356.7	358.3	352.1	346.0	354.0	350.7
29	363.0	356.0	356.0	358.1	356.7	357.6	321.8	350.0	350.0	340.6
30	363.7	342.0	358.1	358.1	352.7	356.9	337.9	350.0	350.0	346.0
31	361.0	...	348.0	362.1	355.1	356.9	...	342.0	354.0	348.0
Mean	364.9	353.1	353.4	359.3	355.3	359.0	346.9	346.6	351.7	348.4

TABLE A-1. (Contd.)

November										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	361.7	...	346.0	358.0	352.0	357.0	...	346.0	354.0	350.0
2	362.3	356.0	354.0	350.0	353.3	357.0	348.0	344.0	346.0	346.0
3	363.0	356.0	348.0	358.1	354.0	358.3	352.0	342.0	350.0	348.0
4	362.3	354.0	354.0	362.1	356.7	356.9	350.0	346.0	354.0	350.0
5	365.1	352.0	356.0	358.1	355.4	358.3	348.0	350.0	350.0	349.3
6	364.4	354.0	358.1	...	356.0	359.0	348.0	346.0	...	347.0
7	366.4	350.0	348.0	362.1	353.4	362.3	346.0	342.0	358.1	348.7
8	366.4	350.0	346.0	354.0	350.0	363.7	344.0	342.0	346.0	344.0
9	369.1	350.0	362.1	354.0	355.4	365.1	344.0	350.0	350.0	348.0
10	368.4	352.0	358.1	358.1	356.1	364.3	350.0	322.0	354.0	342.0
11	368.6	354.0	344.0	358.1	352.0	358.3	348.0	342.0	350.0	346.7
12	360.3	356.0	346.0	...	351.0	355.6	354.0	338.0	...	346.0
13	361.7	354.0	354.0	...	354.0	357.6	350.0	346.0	...	348.0
14	361.7	354.0	354.0	350.0	352.7	356.3	346.0	346.0	346.0	346.0
15	361.7	352.0	354.0	358.1	354.7	355.6	348.0	346.0	350.0	348.0
16	364.4	350.0	354.0	358.1	354.0	357.6	346.0	346.0	354.0	348.7
17	365.7	350.0	362.1	362.1	358.1	359.0	344.0	354.0	358.1	352.0
18	362.3	348.0	362.1	358.1	356.1	356.2	344.0	354.0	350.0	349.3
19	360.2	354.0	362.1	358.1	358.1	356.2	352.0	354.0	350.0	352.0
20	363.3	346.0	362.1	...	349.0	355.2	342.0	346.0	...	344.0
21	367.7	...	354.0	358.1	356.1	354.3	...	346.0	350.0	348.0
22	365.0	...	354.0	354.0	354.0	359.0	...	346.0	346.0	346.0
23	366.4	...	358.1	...	358.1	359.0	...	350.0	...	350.0
24	362.4	...	354.0	...	354.0	353.6	...	346.0	...	346.0
25	356.3	358.1	354.0	...	356.0	350.9	346.0	346.0	...	346.0
26	355.6	356.0	354.0	...	355.0	350.2	348.0	346.0	...	347.0
27	357.0	360.1	354.0	...	358.0	351.6	348.0	346.0	...	347.0
28	360.7	352.0	358.1	362.1	357.4	351.5	348.0	350.0	354.0	350.7
29	361.0	352.0	366.1	362.1	360.1	356.3	348.0	356.0	358.1	354.0
30	363.7	352.0	376.2	362.1	363.4	356.9	346.0	358.1	358.1	354.7
31	...	...	...	...	...	...	...	...	...	...
Mean	363.2	352.8	356.0	357.9	355.6	357.1	347.7	346.3	351.7	348.6

TABLE A-1. (Contd.)

December										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	362.4	356.0	348.0	362.1	355.4	356.3	350.0	342.0	354.0	348.7
2	363.0	356.0	350.0	...	353.0	356.3	352.0	342.0	...	347.0
3	361.7	354.0	356.0	...	355.0	355.6	348.0	350.0	...	349.0
4	360.3	354.0	354.0	...	354.0	354.9	350.0	350.0	...	350.0
5	365.1	356.0	354.0	354.0	354.7	357.6	352.0	350.0	350.0	350.7
6	365.7	358.1	360.1	358.1	358.8	358.3	350.0	350.0	354.0	351.3
7	356.2	354.0	362.1	362.1	359.4	351.2	350.0	352.0	354.0	352.0
8	361.0	356.0	352.0	...	354.0	350.9	350.0	348.0	...	349.0
9	359.7	358.1	360.1	...	357.0	353.6	352.0	354.0	...	353.0
10	362.4	360.1	356.0	...	358.0	357.6	358.1	350.1	...	354.1
11	361.7	360.1	...	...	360.1	355.6	356.0	...	...	356.0
12	361.7	362.0	...	358.1	360.1	357.6	356.0	...	350.0	353.0
13	360.5	356.0	356.0	362.1	358.0	358.4	348.0	350.0	354.0	350.7
14	...	356.0	354.0	362.1	357.4	...	350.0	350.0	358.1	352.7
15	...	364.1	354.0	366.1	361.4	356.3	356.1	348.0	358.1	354.1
16	359.3	356.0	356.0	362.1	358.0	354.2	352.0	350.0	358.1	353.4
17	362.3	354.0	360.1	374.1	362.7	355.2	350.0	354.0	350.0	351.3
18	364.3	358.1	356.0	...	357.1	357.3	352.0	350.0	...	351.0
19	360.3	360.1	360.1	...	360.1	355.3	354.0	352.0	...	353.0
20	...	360.1	362.1	...	361.1	355.3	356.0	358.1	...	357.0
21	...	358.1	366.1	...	362.1	...	346.0	358.1	...	352.0
22	363.7	354.0	370.1	...	362.1	356.3	348.0	360.7	...	354.4
23	364.5	356.0	364.1	...	360.1	358.4	350.0	348.0	...	349.0
24	364.5	356.0	352.0	...	354.0	358.4	350.0	346.0	...	348.0
25	...	360.1	358.1	...	359.0	...	356.0	350.0	...	353.0
26	364.5	364.1	362.1	...	363.1	360.5	354.0	354.	...	354.0
27	366.6	360.1	362.1	...	361.1	358.4	354.0	350.0	...	352.0
28	...	352.0	...	366.1	359.0	...	352.0	...	350.0	351.0
29	360.3	...	...	...	...	356.3	...	...	...	...
30	362.3	...	...	...	...	354.2	...	...	...	...
31	361.3	...	...	...	...	356.3	...	...	...	...
Mean	362.2	357.5	357.9	362.4	359.3	356.2	351.9	350.7	353.7	352.1

TABLE A-2. Coso Corrosion Array Monthly Statistical Data.

Month	1981				1982				1983			
	High flow, pph		Low flow, pph		High flow, pph		Low flow, pph		High flow, pph		Low flow, pph	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Jan	687.0	16.3	641.0	10.5	679.8	39.5	618.0	31.4	574.1	35.9	522.2	24.0
Feb	637.1	31.0	622.7	38.2	681.6	36.0	622.8	25.2	655.3	59.9	604.7	52.7
Mar	723.3	28.4	667.6	28.4	766.8	22.8	715.2	26.4	686.3	20.4	626.7	23.1
Apr	719.8	49.6	656.4	38.8	805.2	24.0	742.8	21.6	679.2	24.5	626.8	20.6
May	912.0	27.2	843.8	34.1	738.0	28.8	667.2	27.6	736.4	44.0	662.8	38.7
Jun	910.8	28.2	857.4	24.4	715.2	14.4	649.2	15.6	738.7	20.2	659.5	16.8
Jul	845.6	19.0	792.6	19.2	720.0	19.2	644.4	16.8	728.4	28.0	642.0	19.9
Aug	808.5	18.4	755.2	13.0	696.0	21.6	626.4	20.4	711.9	39.2	629.0	22.1
Sep	711.2	99.7	638.5	127.7	648.0	30.0	592.8	21.6	709.0	38.0	635.2	21.8
Oct	639.3	45.8	559.8	41.0	598.8	19.2	531.6	24.0	660.9	21.9	607.3	20.0
Nov	705.5	26.0	631.3	32.1	576.0	28.2	519.2	27.8	730.1	25.1	664.3	31.9
Dec	680.1	26.0	613.2	14.1	547.2	26.4	494.4	24.0	697.6	32.9	644.5	28.1

TABLE A-3. Steam Flows in Pounds per Hour (pph) at Coso Corrosion Array Site for 1981 Through 1983.

January										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	708.0	708.0	696.0	516.0	640.0	669.0	636.0	624.0	504.0	588.0
2	702.0	696.0	600.0	516.0	604.0	684.0	636.0	588.0	504.0	576.0
3	724.2	696.0	648.0	516.0	620.0	697.8	636.0	600.0	504.0	580.0
4	736.8	702.0	720.0	516.0	646.0	703.2	636.0	624.0	504.0	588.0
5	750.0	696.0	660.0	528.0	628.0	721.8	636.0	600.0	504.0	580.0
6	761.4	684.0	600.0	588.0	624.0	726.0	636.0	576.0	528.0	580.0
7	748.2	720.0	636.0	564.0	640.0	720.0	648.0	576.0	528.0	584.0
8	743.4	696.0	696.0	600.0	664.0	706.8	648.0	588.0	528.0	588.0
9	763.8	696.0	708.0	588.0	664.0	714.6	636.0	648.0	540.0	608.0
10	762.0	684.0	708.0	576.0	656.0	691.8	636.0	660.0	528.0	608.0
11	...	708.0	732.0	600.0	680.0	...	636.0	672.0	528.0	612.0
12	...	672.0	684.0	600.0	652.0	...	624.0	636.0	528.0	596.0
13	...	684.0	648.0	636.0	656.0	...	636.0	612.0	576.0	608.0
14	...	684.0	696.0	600.0	660.0	...	636.0	612.0	528.0	592.0
15	...	708.0	696.0	600.0	668.0	...	660.0	636.0	540.0	612.0
16	...	690.0	696.0	624.0	670.0	...	660.0	624.0	576.0	620.0
17	...	660.0	744.0	612.0	672.0	...	636.0	660.0	540.0	612.0
18	726.0	666.0	732.0	600.0	666.0	691.0	612.0	672.0	528.0	604.0
19	687.0	696.0	732.0	612.0	680.0	625.2	636.0	684.0	552.0	624.0
20	652.8	696.0	708.0	588.0	664.0	613.2	636.0	636.0	540.0	604.0
21	702.0	684.0	684.0	552.0	640.0	651.6	648.0	624.0	516.0	596.0
22	700.8	684.0	612.0	516.0	604.0	654.0	648.0	588.0	504.0	580.0
23	688.8	684.0	636.0	528.0	616.0	642.0	636.0	576.0	480.0	564.0
24	759.0	696.0	660.0	612.0	656.0	684.0	636.0	588.0	552.0	592.0
25	768.6	702.0	696.0	600.0	666.0	703.8	654.0	624.0	528.0	602.0
26	711.6	672.0	708.0	552.0	644.0	664.8	648.0	600.0	504.0	584.0
27	721.8	690.0	684.0	552.0	642.0	662.4	648.0	617.0	480.0	581.7
28	725.4	648.0	708.0	576.0	644.0	673.8	660.0	648.0	516.0	608.0
29	...	660.0	648.0	576.0	628.0	...	648.0	600.0	504.0	584.0
30	...	672.0	636.0	576.0	628.0	...	648.0	576.0	516.0	580.0
31	...	...	660.0	576.0	618.0	...	...	588.0	504.0	546.0
Mean	725.9	687.0	679.8	574.1	647.0	681.0	641.0	618.0	522.2	593.7

TABLE A-3. (Contd.)

February										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	...	636.0	660.0	576.0	624.0	...	624.0	612.0	528.0	588.0
2	...	678.0	660.0	576.0	638.0	...	636.0	600.0	516.0	584.0
3	628.8	672.0	708.0	552.0	644.0	594.0	636.0	624.0	528.0	596.0
4	636.0	684.0	684.0	552.0	640.0	561.6	636.0	612.0	528.0	592.0
5	654.0	690.0	624.0	576.0	630.0	618.0	636.0	588.0	528.0	584.0
6	666.0	684.0	624.0	552.0	620.0	630.0	648.0	588.0	528.0	588.0
7	670.8	684.0	672.0	552.0	636.0	647.4	624.0	600.0	528.0	584.0
8	646.8	660.0	696.0	648.0	668.0	612.0	648.0	624.0	612.0	628.0
9	634.8	696.0	696.0	600.0	664.0	610.2	672.0	636.0	600.0	636.0
10	664.8	660.0	684.0	648.0	664.0	632.8	636.0	624.0	576.0	612.0
11	670.8	600.0	648.0	660.0	634.0	654.0	600.0	636.0	600.0	612.0
12	...	630.0	636.0	648.0	638.0	...	576.0	600.0	600.0	592.0
13	...	624.0	624.0	660.0	636.0	...	552.0	576.0	612.0	580.0
14	...	666.0	660.0	684.0	670.0	...	582.0	588.0	624.0	598.0
15	...	678.0	708.0	660.0	682.0	...	600.0	636.0	624.0	620.0
16	...	696.0	696.0	684.0	692.0	...	618.0	636.0	612.0	622.0
17	...	708.0	708.0	708.0	708.0	...	648.0	636.0	648.0	644.0
18	...	660.0	708.0	708.0	692.0	...	600.0	624.0	636.0	620.0
19	...	696.0	660.0	720.0	692.0	...	618.0	612.0	672.0	634.0
20	...	672.0	660.0	684.0	672.0	...	576.0	612.0	648.0	612.0
21	...	612.0	612.0	684.0	636.0	...	552.0	600.0	612.0	588.0
22	676.8	654.0	720.0	708.0	694.0	649.8	552.0	672.0	624.0	616.0
23	657.0	720.0	732.0	720.0	724.0	600.0	666.0	612.0	684.0	654.0
24	570.0	726.0	732.0	732.0	730.0	540.0	690.0	672.0	684.0	682.0
25	627.2	708.0	708.0	732.0	716.0	591.2	678.0	660.0	672.0	670.0
26	660.0	672.0	744.0	684.0	700.0	615.2	648.0	648.0	648.0	648.0
27	656.0	696.0	708.0	696.0	700.0	640.4	624.0	660.0	636.0	640.0
28	692.0	684.0	696.0	684.0	688.0	643.6	660.0	636.0	636.0	644.0
29	...	...	...	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
Mean	650.7	673.1	681.0	655.3	669.8	615.0	622.7	622.3	604.7	616.6

TABLE A-3. (Contd.)

March										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	695.2	684.0	696.0	672.0	684.0	644.0	660.0	672.0	648.0	660.0
2	664.0	708.0	768.0	672.0	716.0	624.4	684.0	684.0	648.0	72.0
3	658.8	744.0	756.0	732.0	744.0	626.4	684.0	708.0	660.0	684.0
4	666.0	720.0	756.0	696.0	724.0	625.2	690.0	708.0	636.0	678.0
5	678.0	738.0	744.0	684.0	722.0	630.0	708.0	672.0	612.0	664.0
6	660.0	708.0	732.0	660.0	700.0	610.8	666.0	684.0	600.0	650.0
7	635.2	672.0	768.0	684.0	708.0	630.0	624.0	684.0	612.0	640.0
8	652.0	684.0	768.0	696.0	716.0	616.0	618.0	708.0	600.0	642.0
9	668.0	690.0	768.0	672.0	710.6	626.0	642.0	672.0	636.0	650.0
10	661.2	630.0	780.0	696.0	702.0	624.0	684.0	732.0	648.0	688.0
11	676.0	720.0	756.0	720.0	732.0	640.0	672.0	756.0	660.0	696.0
12	672.8	732.0	804.0	708.0	748.0	627.6	672.0	732.0	672.0	692.0
13	645.6	732.0	804.0	696.0	744.0	613.2	702.0	744.0	660.0	702.0
14	648.0	738.0	780.0	696.0	738.0	612.4	660.0	744.0	648.0	684.0
15	663.2	738.0	780.0	708.0	742.0	612.0	648.0	744.0	660.0	684.0
16	652.0	750.0	756.0	696.0	734.0	618.8	672.0	756.0	600.0	676.0
17	654.0	750.0	768.0	708.0	742.0	612.0	684.0	744.0	600.0	676.0
18	672.0	744.0	780.0	708.0	744.0	630.0	696.0	708.0	600.0	668.0
19	690.0	744.0	732.0	696.0	724.0	672.0	684.0	684.0	600.0	656.0
20	...	750.0	744.0	684.0	726.0	...	696.0	672.0	624.0	664.0
21	...	702.0	744.0	648.0	698.0	...	660.0	696.0	612.0	656.0
22	...	720.0	768.0	684.0	724.0	...	636.0	720.0	636.0	664.0
23	...	720.0	780.0	708.0	736.0	...	606.0	720.0	636.0	654.0
24	...	720.0	780.0	672.0	724.0	...	606.0	732.0	624.0	654.0
25	...	756.0	768.0	660.0	728.0	...	684.0	732.0	600.0	672.0
26	...	756.0	804.0	684.0	748.0	...	720.0	732.0	636.0	696.0
27	...	720.0	780.0	684.0	728.0	...	684.0	732.0	624.0	680.0
28	...	726.0	792.0	648.0	722.0	...	660.0	744.0	600.0	668.0
29	...	756.0	768.0	672.0	732.0	...	672.0	732.0	600.0	668.0
30	681.6	732.0	768.0	672.0	724.0	642.6	672.0	708.0	624.0	668.0
31	756.6	738.0	768.0	660.0	722.0	684.0	648.0	708.0	612.0	656.0
Mean	669.1	723.3	766.5	686.3	725.4	629.6	667.6	715.0	626.7	669.8

TABLE A-3. (Contd.)

April										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	738.0	726.0	792.0	720.0	...	711.6	672.0	732.0	660.0	688.0
2	714.0	732.0	756.0	684.0	...	666.0	684.0	696.0	636.0	672.0
3	679.2	828.0	744.0	756.0	...	652.0	642.0	720.0	660.0	674.0
4	703.2	654.0	804.0	708.0	...	663.2	612.0	744.0	672.0	676.0
5	704.8	702.0	804.0	660.0	...	667.2	606.0	732.0	636.0	658.0
6	723.2	768.0	804.0	672.0	...	691.2	726.0	756.0	624.0	702.0
7	707.2	828.0	792.0	672.0	...	668.8	708.0	744.0	612.0	688.0
8	708.0	732.0	792.0	696.0	...	678.0	684.0	720.0	624.0	676.0
9	726.0	738.0	780.0	696.0	...	678.0	672.0	732.0	636.0	680.0
10	690.0	744.0	780.0	684.0	...	672.0	684.0	720.0	636.0	680.0
11	708.0	708.0	792.0	696.0	...	666.0	666.0	732.0	636.0	678.0
12	690.0	696.0	804.0	672.0	...	666.0	648.0	732.0	636.0	672.0
13	708.0	684.0	828.0	648.0	...	678.0	630.0	756.0	612.0	666.0
14	702.0	696.0	840.0	648.0	...	678.0	642.0	780.0	588.0	670.0
15	720.0	696.0	828.0	660.0	...	678.0	648.0	780.0	600.0	676.0
16	708.0	702.0	804.0	684.0	...	660.0	642.0	756.0	612.0	670.0
17	690.0	720.0	804.0	720.0	...	666.0	666.0	732.0	648.0	682.0
18	...	708.0	792.0	684.0	...	...	636.0	732.0	636.0	668.0
19	690.0	636.0	804.0	684.0	...	666.0	600.0	756.0	624.0	660.0
20	714.0	648.0	780.0	684.0	...	678.0	612.0	720.0	636.0	656.0
21	720.0	684.0	780.0	660.0	...	684.0	612.0	732.0	624.0	656.0
22	708.0	684.0	804.0	660.0	...	684.0	636.0	744.0	600.0	660.0
23	708.0	684.0	816.0	672.0	...	684.0	636.0	732.0	612.0	660.0
24	...	696.0	828.0	672.0	...	...	648.0	744.0	636.0	676.0
25	...	696.0	840.0	684.0	...	...	660.0	744.0	624.0	676.0
26	...	714.0	804.0	660.0	...	...	600.0	780.0	636.0	672.0
27	702.0	708.0	828.0	660.0	...	678.0	660.0	780.0	636.0	692.0
28	720.0	756.0	816.0	672.0	...	684.0	672.0	756.0	624.0	684.0
29	732.0	804.0	852.0	672.0	...	708.0	744.0	756.0	612.0	704.0
30	756.0	822.0	828.0	636.0	...	720.0	744.0	720.0	576.0	680.0
31	...	...	...	...	...	...	...	...	...	...
Mean	710.4	719.8	804.8	679.2	...	677.9	656.4	743.2	626.9	675.5

TABLE A-3. (Contd.)

May										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	762.0	864.0	828.0	636.0	776.0	714.0	780.0	756.0	576.0	704.0
2	716.0	948.0	792.0	636.0	792.0	680.0	810.0	720.0	600.0	710.0
3	702.0	870.0	720.0	684.0	758.0	666.0	804.0	696.0	600.0	700.0
4	714.0	864.0	720.0	696.0	760.0	654.0	792.0	660.0	600.0	684.0
5	744.0	876.0	720.0	696.0	764.0	704.0	756.0	660.0	648.0	688.0
6	736.0	876.0	732.0	672.0	760.0	704.0	804.0	660.0	624.0	696.0
7	720.0	876.0	768.0	720.0	788.0	692.0	804.0	672.0	624.0	700.0
8	724.0	876.0	780.0	768.0	808.0	688.0	816.0	696.0	672.0	728.0
9	732.0	882.0	756.0	732.0	790.0	692.0	804.0	684.0	684.0	724.0
10	714.0	924.0	708.0	744.0	792.0	678.0	828.0	660.0	696.0	728.0
11	684.0	930.0	696.0	696.0	774.0	654.0	864.0	660.0	660.0	728.0
12	666.0	936.0	732.0	708.0	792.0	636.0	858.0	636.0	648.0	714.0
13	716.0	924.0	720.0	720.0	788.0	680.0	852.0	648.0	684.0	728.0
14	728.0	948.0	720.0	720.0	796.0	696.0	876.0	660.0	660.0	732.0
15	732.0	954.0	720.0	756.0	810.0	704.0	882.0	648.0	660.0	730.0
16	716.0	912.0	732.0	732.0	792.0	680.0	846.0	648.0	696.0	730.0
17	700.0	900.0	708.0	732.0	780.0	672.0	828.0	660.0	672.0	720.0
18	700.0	912.0	756.0	768.0	812.0	676.0	852.0	696.0	672.0	740.0
19	716.0	912.0	708.0	768.0	796.0	680.0	876.0	660.0	696.0	744.0
20	728.0	912.0	720.0	756.0	796.0	684.0	852.0	660.0	672.0	728.0
21	724.0	912.0	744.0	780.0	812.0	696.0	840.0	660.0	672.0	724.0
22	736.0	924.0	744.0	780.0	816.0	700.0	852.0	660.0	732.0	748.0
23	736.0	924.0	756.0	780.0	820.0	704.0	870.0	672.0	696.0	746.0
24	716.0	936.0	768.0	720.0	808.0	704.0	870.0	696.0	696.0	754.0
25	712.0	924.0	756.0	780.0	820.0	668.0	876.0	672.0	696.0	748.0
26	716.0	924.0	756.0	780.0	820.0	688.0	876.0	684.0	684.0	748.0
27	712.0	876.0	720.0	780.0	792.0	688.0	864.0	636.0	672.0	724.0
28	708.0	930.0	732.0	780.0	814.0	680.0	864.0	636.0	600.0	700.0
29	720.0	936.0	720.0	792.0	812.0	684.0	882.0	624.0	672.0	726.0
30	726.0	936.0	708.0	780.0	808.0	696.0	876.0	636.0	720.0	744.0
31	690.0	930.0	756.0	...	843.0	696.0	876.0	660.0	...	768.0
Mean	717.6	912.0	738.6	736.4	795.7	685.1	843.8	667.0	662.8	724.5

TABLE A-3. (Contd.)

June										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	720.0	936.0	708.0	...	822.0	696.0	912.0	660.0	...	786.0
2	738.0	948.0	720.0	...	834.0	702.0	888.0	648.0	...	768.0
3	704.0	924.0	708.0	...	816.0	676.0	870.0	636.0	...	753.0
4	678.0	936.0	732.0	...	834.0	654.0	876.0	648.0	...	762.0
5	684.0	942.0	720.0	...	831.0	660.0	876.0	660.0	...	768.0
6	708.0	936.0	708.0	...	822.0	672.0	882.0	636.0	...	759.0
7	696.0	936.0	696.0	744.0	792.0	656.0	870.0	648.0	636.0	718.0
8	676.0	936.0	696.0	720.0	784.0	652.0	900.0	624.0	660.0	728.0
9	680.0	942.0	708.0	732.0	794.0	628.0	888.0	636.0	660.0	728.0
10	696.0	942.0	732.0	744.0	806.0	668.0	876.0	636.0	660.0	724.0
11	680.0	936.0	732.0	756.0	808.0	644.0	876.0	660.0	660.0	732.0
12	672.0	924.0	720.0	744.0	796.0	644.0	864.0	660.0	696.0	740.0
13	680.0	900.0	720.0	720.0	780.0	652.0	840.0	624.0	660.0	708.0
14	680.0	864.0	696.0	720.0	760.0	660.0	834.0	624.0	660.0	706.0
15	684.0	852.0	720.0	732.0	768.0	692.0	816.0	672.0	636.0	708.0
16	688.0	842.0	720.0	768.0	776.7	656.0	816.0	660.0	660.0	712.0
17	676.0	912.0	744.0	768.0	808.0	648.0	840.0	660.0	672.0	724.0
18	668.0	912.0	744.0	780.0	812.0	640.0	864.0	660.0	660.0	728.0
19	656.0	900.0	720.0	780.0	800.0	624.0	852.0	660.0	672.0	728.0
20	660.0	912.0	708.0	744.0	788.0	632.0	852.0	636.0	696.0	728.0
21	660.0	912.0	720.0	720.0	784.0	628.0	852.0	624.0	660.0	712.0
22	664.0	912.0	720.0	708.0	780.0	636.0	852.0	660.0	636.0	716.0
23	656.0	912.0	708.0	720.0	780.0	640.0	864.0	672.0	636.0	724.0
24	660.0	888.0	708.0	720.0	772.0	632.0	852.0	660.0	636.0	716.0
25	662.0	876.0	708.0	744.0	776.0	622.0	828.0	672.0	648.0	716.0
26	670.0	894.0	696.0	744.0	778.0	636.0	828.0	660.0	660.0	716.0
27	648.0	888.0	708.0	720.0	772.0	621.0	852.0	624.0	660.0	712.0
28	642.0	876.0	732.0	732.0	780.0	627.0	840.0	636.0	684.0	720.0
29	654.0	858.0	696.0	756.0	770.0	618.0	834.0	660.0	660.0	716.0
30	657.0	876.0	696.0	720.0	764.0	624.0	828.0	648.0	672.0	716.0
31	...	...	...	...	...	...	...	...	...	...
Mean	676.6	910.8	714.8	738.7	788.1	648.0	857.4	648.8	659.5	721.9

TABLE A-3. (Contd.)

July										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	648.0	876.0	684.0	756.0	772.0	618.0	828.0	600.0	660.0	696.0
2	648.0	858.0	696.0	732.0	762.0	571.0	816.0	612.0	648.0	692.0
3	663.0	858.0	720.0	744.0	774.0	630.0	804.0	624.0	648.0	692.0
4	663.0	870.0	732.0	684.0	762.0	636.0	816.0	648.0	636.0	700.0
5	657.0	864.0	696.0	...	780.0	639.0	810.0	636.0	...	723.0
6	660.0	864.0	696.0	744.0	768.0	636.0	810.0	660.0	696.0	722.0
7	660.0	864.0	708.0	744.0	772.0	636.0	816.0	636.0	636.0	696.0
8	648.0	840.0	708.0	720.0	756.0	624.0	792.0	636.0	648.0	692.0
9	654.0	852.0	708.0	708.0	756.0	624.0	786.0	636.0	624.0	682.0
10	660.0	864.0	708.0	708.0	760.0	630.0	804.0	624.0	624.0	684.0
11	675.0	852.0	732.0	696.0	760.0	645.0	792.0	648.0	612.0	684.0
12	666.0	840.0	732.0	744.0	772.0	642.0	786.0	648.0	672.0	702.0
13	654.0	834.0	756.0	756.0	782.0	627.0	780.0	660.0	648.0	696.0
14	648.0	852.0	744.0	768.0	788.0	624.0	786.0	660.0	648.0	698.0
15	666.0	852.0	744.0	756.0	784.0	624.0	804.0	660.0	660.0	688.0
16	681.0	858.0	732.0	780.0	790.0	636.0	816.0	648.0	672.0	712.0
17	676.0	852.0	732.0	756.0	780.0	638.0	804.0	636.0	660.0	700.0
18	682.0	840.0	720.0	720.0	760.0	648.0	786.0	636.0	660.0	694.0
19	680.0	828.0	732.0	696.0	752.0	640.0	780.0	636.0	624.0	680.0
20	672.0	840.0	720.0	696.0	752.0	640.0	804.0	648.0	612.0	680.0
21	666.0	840.0	720.0	696.0	752.0	627.0	780.0	648.0	648.0	692.0
22	669.0	852.0	708.0	720.0	754.0	624.0	798.0	648.0	612.0	686.0
23	680.0	858.0	720.0	720.0	766.0	632.0	798.0	660.0	636.0	698.0
24	680.0	858.0	696.0	720.0	758.0	632.0	798.0	660.0	636.0	698.0
25	663.0	846.0	708.0	720.0	758.0	624.0	792.0	636.0	636.0	688.0
26	678.0	822.0	720.0	720.0	754.0	615.0	780.0	648.0	660.0	696.0
27	675.0	822.0	684.0	708.0	738.0	633.0	768.0	624.0	636.0	676.0
28	696.0	822.0	732.0	708.0	754.0	642.0	768.0	648.0	636.0	684.0
29	684.0	828.0	744.0	708.0	760.0	645.0	768.0	672.0	624.0	688.0
30	690.0	804.0	744.0	720.0	756.0	648.0	750.0	672.0	624.0	682.0
31	696.0	804.0	756.0	804.0	788.0	648.0	750.0	660.0	624.0	678.0
Mean	669.0	845.6	720.4	728.4	764.8	631.5	792.6	644.1	642.0	692.9

TABLE A-3. (Contd.)

August										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	700.0	804.0	744.0	768.0	772.0	664.0	750.0	672.0	648.0	690.0
2	704.0	810.0	720.0	756.0	762.0	660.0	756.0	648.0	636.0	680.0
3	724.0	816.0	708.0	768.0	764.0	672.0	780.0	648.0	636.0	688.0
4	699.0	816.0	696.0	756.0	756.0	648.0	756.0	636.0	648.0	680.0
5	684.0	804.0	696.0	768.0	756.0	642.0	756.0	624.0	636.0	672.0
6	688.0	804.0	672.0	768.0	748.0	648.0	750.0	636.0	660.0	682.0
7	688.0	834.0	684.0	744.0	754.0	644.0	768.0	624.0	660.0	684.0
8	693.0	834.0	708.0	732.0	758.0	648.0	780.0	612.0	660.0	684.0
9	702.0	822.0	720.0	660.0	734.0	642.0	768.0	624.0	624.0	672.0
10	699.0	822.0	744.0	696.0	754.0	636.0	768.0	660.0	612.0	680.0
11	702.0	792.0	720.0	708.0	740.0	648.0	744.0	612.0	612.0	656.0
12	702.0	816.0	708.0	732.0	752.0	656.0	756.0	636.0	624.0	672.0
13	704.0	792.0	696.0	756.0	748.0	660.0	756.0	624.0	648.0	676.0
14	694.0	774.0	696.0	744.0	738.0	656.0	738.0	612.0	660.0	670.0
15	684.0	774.0	684.0	672.0	710.0	644.0	738.0	612.0	636.0	662.0
16	690.0	798.0	696.0	672.0	722.0	654.0	750.0	624.0	624.0	666.0
17	684.0	828.0	684.0	696.0	736.0	633.0	780.0	600.0	612.0	664.0
18	654.0	810.0	708.0	672.0	730.0	621.0	768.0	660.0	600.0	676.0
19	642.0	786.0	696.0	636.0	706.0	594.0	744.0	648.0	588.0	660.0
20	676.0	798.0	708.0	660.0	722.0	628.0	732.0	660.0	600.0	664.0
21	688.0	816.0	696.0	600.0	724.0	636.0	744.0	636.0	600.0	660.0
22	700.0	804.0	708.0	672.0	728.0	652.0	744.0	624.0	636.0	668.0
23	692.0	804.0	696.0	684.0	728.0	652.0	744.0	624.0	600.0	656.0
24	704.0	816.0	684.0	672.0	724.0	656.0	744.0	600.0	612.0	652.0
25	700.0	804.0	696.0	684.0	728.0	656.0	744.0	600.0	600.0	648.0
26	704.0	816.0	672.0	708.0	732.0	664.0	756.0	612.0	612.0	660.0
27	710.0	828.0	672.0	720.0	740.0	668.0	768.0	600.0	624.0	664.0
28	706.0	816.0	660.0	732.0	736.0	664.0	768.0	612.0	636.0	672.0
29	704.0	822.0	672.0	720.0	738.0	672.0	762.0	600.0	660.0	674.0
30	712.0	828.0	672.0	720.0	740.0	668.0	752.0	624.0	660.0	678.7
31	710.0	804.0	660.0	732.0	732.0	670.0	744.0	600.0	636.0	660.0
Mean	694.9	808.5	696.0	711.9	738.8	650.2	755.2	625.9	629.0	670.0

TABLE A-3. (Contd.)

September										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	700.0	798.0	672.0	732.0	734.0	660.0	732.0	612.0	648.0	664.0
2	688.0	798.0	696.0	756.0	750.0	644.0	738.0	600.0	648.0	662.0
3	648.0	792.0	684.0	768.0	748.0	594.0	726.0	648.0	660.0	678.0
4	696.0	804.0	672.0	756.0	744.0	656.0	732.0	612.0	672.0	672.0
5	688.0	804.0	672.0	756.0	744.0	644.0	744.0	612.0	660.0	672.0
6	688.0	786.0	672.0	744.0	734.0	636.0	744.0	612.0	672.0	676.0
7	684.0	...	684.0	720.0	702.0	656.0	...	612.0	648.0	630.0
8	678.0	732.0	672.0	696.0	700.0	648.0	702.0	612.0	636.0	650.0
9	678.0	774.0	636.0	708.0	706.0	660.0	708.0	600.0	684.0	664.0
10	690.0	780.0	684.0	720.0	728.0	666.0	732.0	600.0	612.0	648.0
11	684.0	762.0	648.0	720.0	710.0	648.0	738.0	600.0	636.0	658.0
12	666.0	786.0	660.0	684.0	710.0	636.0	726.0	588.0	612.0	642.0
13	672.0	786.0	660.0	744.0	730.0	636.0	726.0	600.0	660.0	662.0
14	666.0	792.0	660.0	732.0	728.0	630.0	738.0	600.0	636.0	658.0
15	636.0	768.0	636.0	720.0	708.0	606.0	738.0	588.0	636.0	654.0
16	666.0	780.0	588.0	732.0	700.0	618.0	714.0	576.0	624.0	638.0
17	690.0	750.0	600.0	732.0	694.0	654.0	714.0	528.0	636.0	626.0
18	660.0	...	600.0	732.0	666.0	618.0	...	564.0	636.0	600.0
19	642.0	...	648.0	732.0	690.0	612.0	...	564.0	636.0	600.0
20	642.0	...	636.0	720.0	678.0	618.0	...	576.0	636.0	606.0
21	660.0	408.0	660.0	684.0	584.0	630.0	360.0	576.0	612.0	512.0
22	642.0	630.0	648.0	672.0	650.0	624.0	300.0	588.0	600.0	496.0
23	642.0	624.0	648.0	684.0	652.0	606.0	524.0	588.0	612.0	574.7
24	648.0	624.0	600.0	672.0	632.0	618.0	522.0	588.0	624.0	578.0
25	654.0	618.0	600.0	648.0	622.0	618.0	534.0	588.0	600.0	574.0
26	654.0	618.0	660.0	672.0	650.0	630.0	534.0	600.0	636.0	590.0
27	660.0	624.0	660.0	660.0	648.0	630.0	540.0	600.0	636.0	592.0
28	654.0	624.0	...	672.0	648.0	624.0	540.0	...	624.0	582.0
29	648.0	624.0	636.0	660.0	640.0	618.0	552.0	588.0	624.0	588.0
30	654.0	606.0	600.0	612.0	606.0	624.0	540.0	564.0	600.0	568.0
31	...	...	...	...	...	...	...	...	...	...
Mean	665.9	711.2	648.0	708.0	689.1	632.1	638.5	592.6	635.2	622.1

TABLE A-3. (Contd.)

October										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	648.0	570.0	588.0	696.0	618.0	630.0	492.0	504.0	576.0	524.0
2	648.0	630.0	600.0	648.0	626.0	630.0	546.0	516.0	576.0	546.0
3	654.0	636.0	...	648.0	642.0	624.0	576.0	...	588.0	582.0
4	648.0	624.0	660.0	660.0	648.0	624.0	546.0	600.0	600.0	582.0
5	654.0	612.0	...	648.0	630.0	618.0	540.0	...	612.0	576.0
6	660.0	630.0	600.0	660.0	630.0	624.0	528.0	552.0	588.0	556.0
7	672.0	666.0	624.0	636.0	642.0	642.0	576.0	528.0	612.0	572.0
8	668.0	636.0	624.0	660.0	640.0	644.0	564.0	552.0	588.0	568.0
9	636.0	648.0	588.0	648.0	628.0	618.0	552.0	504.0	600.0	552.0
10	630.0	648.0	600.0	648.0	632.0	594.0	564.0	528.0	600.0	564.0
11	666.0	624.0	600.0	672.0	632.0	624.0	564.0	504.0	636.0	568.0
12	666.0	612.0	600.0	684.0	632.0	648.0	552.0	552.0	600.0	568.0
13	660.0	588.0	600.0	720.0	636.0	636.0	528.0	516.0	648.0	564.0
14	668.0	552.0	600.0	660.0	604.0	636.0	516.0	528.0	624.0	556.0
15	668.0	600.0	588.0	...	594.0	636.0	522.0	516.0	...	519.0
16	676.0	612.0	600.0	...	606.0	636.0	522.0	516.0	...	519.0
17	672.0	606.0	636.0	...	621.0	628.0	516.0	552.0	...	534.0
18	664.0	612.0	...	636.0	624.0	624.0	558.0	...	600.0	579.0
19	674.0	630.0	612.0	660.0	634.0	612.0	564.0	576.0	576.0	572.0
20	668.0	636.0	600.0	624.0	620.0	620.0	552.0	552.0	612.0	572.0
21	680.0	630.0	588.0	684.0	634.0	624.0	546.0	528.0	624.0	566.0
22	652.0	708.0	588.0	660.0	652.0	606.0	534.0	528.0	600.0	554.0
23	652.0	...	600.0	672.0	636.0	604.0	...	528.0	600.0	564.0
24	714.0	...	600.0	684.0	642.0	654.0	...	552.0	612.0	582.0
25	732.0	...	600.0	636.0	618.0	678.0	...	552.0	600.0	576.0
26	747.0	...	588.0	660.0	624.0	669.0	...	528.0	624.0	576.0
27	650.0	708.0	576.0	696.0	660.0	612.0	594.0	504.0	648.0	582.0
28	654.0	684.0	576.0	672.0	644.0	604.0	648.0	504.0	636.0	596.0
29	662.0	696.0	588.0	648.0	644.0	610.0	642.0	516.0	624.0	594.0
30	633.0	720.0	576.0	648.0	648.0	564.0	618.0	528.0	600.0	582.0
31	652.0	744.0	576.0	636.0	652.0	604.0	654.0	504.0	600.0	586.0
Mean	665.4	639.3	599.1	660.9	633.1	625.1	559.8	531.0	607.3	566.0

TABLE A-3. (Contd.)

November										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	646.0	720.0	576.0	732.0	676.0	604.0	654.0	504.0	612.0	590.0
2	646.0	714.0	576.0	720.0	670.0	596.0	642.0	504.0	600.0	582.0
3	632.0	738.0	576.0	732.0	682.0	604.0	636.0	504.0	600.0	580.0
4	660.0	774.0	576.0	756.0	702.0	606.0	738.0	480.0	684.0	634.0
5	658.0	708.0	588.0	744.0	680.0	604.0	636.0	516.0	696.0	616.0
6	654.0	714.0	588.0	732.0	678.0	606.0	636.0	528.0	672.0	612.0
7	668.0	696.0	600.0	756.0	684.0	614.0	618.0	540.0	708.0	622.0
8	768.0	672.0	636.0	708.0	672.0	626.0	600.0	552.0	672.0	608.0
9	702.0	678.0	576.0	696.0	650.0	648.0	600.0	552.0	636.0	596.0
10	692.0	684.0	540.0	720.0	648.0	650.0	600.0	516.0	648.0	588.0
11	660.0	702.0	528.0	732.0	654.0	620.0	612.0	480.0	684.0	592.0
12	638.0	738.0	540.0	744.0	674.0	588.0	636.0	480.0	672.0	596.0
13	648.0	690.0	564.0	756.0	670.0	590.0	654.0	504.0	672.0	610.0
14	638.0	708.0	552.0	696.0	652.0	580.0	624.0	480.0	636.0	580.0
15	620.0	708.0	576.0	708.0	664.0	586.0	606.0	504.0	636.0	582.0
16	624.0	708.0	576.0	732.0	672.0	568.0	618.0	540.0	660.0	606.0
17	652.0	672.0	612.0	780.0	688.0	604.0	612.0	540.0	708.0	620.0
18	652.0	...	600.0	744.0	672.0	584.0	...	552.0	672.0	612.0
19	654.0	...	600.0	720.0	660.0	564.0	...	552.0	660.0	606.0
20	622.0	...	576.0	780.0	678.0	568.0	...	516.0	720.0	618.0
21	630.0	...	552.0	732.0	642.0	540.0	...	504.0	684.0	594.0
22	642.0	...	540.0	672.0	606.0	558.0	...	516.0	648.0	582.0
23	646.0	708.0	528.0	...	618.0	582.0	660.0	504.0	...	582.0
24	...	...	564.0	...	564.0	...	...	504.0	...	504.0
25	...	...	564.0	...	564.0	...	...	504.0	...	504.0
26	...	...	564.0	...	564.0	...	...	504.0	...	504.0
27	...	...	576.0	...	576.0	...	...	504.0	...	504.0
28	...	...	576.0	708.0	642.0	...	...	528.0	660.0	594.0
29	...	...	624.0	732.0	678.0	...	...	576.0	672.0	624.0
30	...	672.0	636.0	720.0	676.0	...	612.0	588.0	696.0	632.0
31	...	...	...	...	...	...	...	...	...	...
Mean	654.0	705.5	576.0	730.1	670.5	595.2	631.3	519.2	664.3	604.9

TABLE A-3. (Contd.)

December										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	672.0	...	588.0	744.0	666.0	618.0	...	528.0	684.0	606.0
2	660.0	...	528.0	744.0	636.0	576.0	...	492.0	684.0	588.0
3	606.0	672.0	528.0	720.0	640.0	558.0	612.0	456.0	684.0	584.0
4	645.0	672.0	540.0	684.0	632.0	552.0	606.0	480.0	624.0	570.0
5	654.0	684.0	564.0	660.0	636.0	606.0	606.0	492.0	612.0	570.0
6	642.0	696.0	576.0	672.0	648.0	573.0	624.0	528.0	624.0	592.0
7	...	684.0	564.0	684.0	644.0	...	612.0	528.0	624.0	588.0
8	...	690.0	540.0	708.0	646.0	...	612.0	504.0	648.0	588.0
9	...	690.0	576.0	732.0	666.0	...	624.0	528.0	672.0	608.0
10	...	684.0	564.0	696.0	648.0	...	624.0	516.0	648.0	596.0
11	606.0	708.0	540.0	696.0	648.0	534.0	630.0	504.0	648.0	594.0
12	612.0	714.0	564.0	672.0	650.0	567.0	636.0	492.0	636.0	588.0
13	594.0	666.0	576.0	696.0	646.0	546.0	612.0	492.0	636.0	580.0
14	...	648.0	528.0	720.0	632.0	...	594.0	492.0	648.0	578.0
15	...	708.0	504.0	720.0	644.0	...	624.0	480.0	672.0	592.0
16	792.0	672.0	528.0	720.0	640.0	738.0	618.0	480.0	660.0	586.0
17	804.0	660.0	576.0	708.0	648.0	750.0	606.0	492.0	648.0	582.0
18	780.0	648.0	564.0	684.0	632.0	732.0	606.0	504.0	636.0	582.0
19	796.0	696.0	576.0	732.0	668.0	744.0	618.0	504.0	660.0	592.0
20	...	714.0	...	744.0	729.0	...	594.0	...	696.0	645.0
21	...	696.0	...	732.0	714.0	...	624.0	...	672.0	648.0
22	...	642.0	588.0	720.0	650.0	...	600.0	552.0	672.0	608.0
23	...	642.0	576.0	696.0	638.0	...	600.0	504.0	648.0	584.0
24	...	636.0	504.0	660.0	600.0	...	582.0	468.0	648.0	566.0
25	...	666.0	516.0	672.0	618.0	...	606.0	480.0	648.0	578.0
26	...	708.0	528.0	708.0	648.0	...	636.0	480.0	648.0	588.0
27	...	732.0	528.0	732.0	664.0	...	600.0	456.0	612.0	556.0
28	...	654.0	504.0	636.0	598.0	...	636.0	456.0	600.0	564.0
29	624.0	...	528.0	624.0	576.0	576.0	...	480.0	588.0	534.0
30	615.0	...	552.0	660.0	606.0	552.0	...	492.0	600.0	546.0
31	696.0	...	528.0	648.0	588.0	648.0	...	468.0	600.0	534.0
Mean	674.9	680.1	547.5	697.6	641.7	616.9	613.2	494.1	644.5	583.9

TABLE A-4. Steam Flow in Pounds per Hour (pph) at Two-Inch Well.

January										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	...	124.0	131.9	...	128.0	...	120.9	117.8	...	119.4
2	...	120.9	124.0	128.7	124.5	...	119.3	113.0	114.6	115.6
3	...	122.5	116.2	131.9	123.5	...	119.3	97.3	105.2	107.3
4	...	124.0	117.8	130.3	124.0	...	119.3	105.2	103.6	109.4
5	...	124.8	127.2	133.5	128.5	...	117.8	108.3	103.6	109.9
6	...	121.7	116.2	131.9	123.3	...	116.2	102.1	102.1	106.8
7	...	124.0	...	136.6	130.3	...	113.8	...	106.8	110.3
8	...	120.9	...	122.5	121.7	...	116.2	...	111.5	113.9
9	...	122.5	...	133.5	128.0	...	116.2	...	102.1	109.2
10	...	120.9	...	135.0	128.0	...	114.6	...	114.6	114.6
11	...	117.8	130.3	136.6	128.2	...	115.4	116.2	108.3	113.3
12	...	119.3	120.9	138.2	126.1	...	116.2	106.8	106.8	109.9
13	...	120.1	111.5	...	115.8	...	113.0	100.5	...	106.8
14	...	120.9	128.7	135.0	128.2	...	115.4	97.3	102.1	104.9
15	...	122.5	125.6	136.6	128.2	...	117.8	109.9	105.2	111.0
16	...	120.9	127.2	138.2	128.8	...	117.8	108.3	117.8	114.6
17	...	117.8	122.5	135.0	125.1	...	114.6	117.8	116.2	116.2
18	...	117.0	127.2	135.0	126.4	...	110.7	109.9	109.9	110.2
19	...	122.5	125.6	136.6	128.2	...	114.6	111.5	119.3	115.1
20	...	118.5	122.5	133.5	124.8	...	116.2	113.0	117.8	115.7
21	...	119.3	127.2	127.2	124.6	...	115.4	106.8	105.2	109.1
22	...	117.8	114.6	120.9	117.8	...	116.2	98.6	113.0	109.3
23	...	123.3	117.8	124.0	121.7	...	119.3	97.3	113.0	109.9
24	...	121.7	128.7	131.8	127.4	...	116.2	108.3	111.5	112.0
25	144.4	120.9	...	130.3	125.6	131.1	117.8	...	102.0	109.9
26	143.7	122.5	130.3	131.9	128.2	130.3	117.8	116.2	100.5	111.5
27	146.2	122.5	125.6	133.5	127.2	130.2	119.3	108.3	127.2	118.3
28	142.2	125.6	133.5	131.9	130.3	130.0	119.3	113.0	111.5	114.6
29	140.0	120.9	119.3	133.5	124.6	124.0	117.8	109.9	114.6	114.1
30	131.9	119.3	119.3	135.0	124.5	114.9	119.3	100.5	108.3	109.4
31	129.5	124.0	127.2	...	125.6	114.6	109.9	105.2	...	107.6
Mean	139.7	121.3	123.8	132.4	125.8	129.0	116.6	107.7	109.8	111.4

TABLE A-4. (Contd.)

February										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	134.4	117.8	122.5	133.5	124.6	115.9	112.3	109.9	106.8	109.7
2	134.9	117.8	108.3	128.7	118.3	117.8	113.0	108.3	117.8	113.0
3	141.3	120.9	130.3	127.2	126.1	120.1	116.2	111.5	117.8	115.2
4	136.6	119.3	119.3	131.9	123.5	123.2	115.4	106.8	109.9	110.7
5	138.5	120.9	114.6	125.6	120.4	122.8	115.4	100.5	109.9	108.6
6	143.0	120.9	116.2	125.6	120.9	127.2	118.5	97.3	114.6	110.1
7	133.6	119.3	124.0	136.6	126.6	125.6	116.8	105.2	119.3	113.8
8	134.5	120.9	128.7	136.6	128.7	122.9	117.8	114.6	116.2	116.2
9	134.7	127.2	125.6	135.0	129.3	117.8	122.5	111.5	102.1	112.0
10	138.6	120.9	116.2	133.5	123.5	119.6	115.4	113.0	108.3	112.1
11	139.7	119.3	119.3	131.9	123.4	125.0	115.4	97.3	102.1	104.9
12	141.0	117.8	111.5	133.5	120.9	123.6	113.8	102.1	109.9	108.6
13	134.9	117.8	120.9	...	119.4	125.6	113.8	102.1	...	108.0
14	132.7	122.5	124.0	136.6	127.8	128.0	114.6	97.3	103.6	105.2
15	131.3	125.6	131.9	136.6	131.4	122.5	119.3	116.2	103.6	113.0
16	130.6	127.2	127.2	136.6	130.3	121.7	120.9	113.0	106.8	113.6
17	141.3	127.2	130.3	138.2	131.9	129.5	122.5	114.6	100.5	112.5
18	141.0	124.0	124.0	135.0	127.7	131.3	120.9	111.5	117.8	116.7
19	...	127.2	125.6	133.5	128.8	...	122.5	109.9	109.9	114.1
20	...	126.4	131.9	133.5	130.6	...	114.7	114.6	103.6	111.0
21	...	125.6	130.3	139.7	131.9	...	103.6	116.2	116.2	112.0
22	...	123.3	128.7	139.7	130.6	...	103.6	108.3	116.2	109.4
23	...	131.1	130.3	114.6	125.3	...	111.5	116.2	141.3	123.0
24	...	130.3	130.3	135.0	131.9	...	121.7	114.6	113.0	116.4
25	137.1	...	125.6	139.7	132.7	125.0	...	109.9	108.3	109.1
26	139.3	...	131.9	130.7	131.3	123.7	...	108.3	117.5	112.9
27	141.8	...	125.6	...	125.6	127.2	...	109.9	...	109.9
28	142.9	...	122.5	138.2	130.4	129.5	...	106.8	106.8	106.8
29	142.9	...	...	...	...	128.7	...	...	...	...
30	...	...	...	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...
Mean	137.7	123.0	124.8	134.4	127.4	124.2	115.9	108.8	110.5	111.7

TABLE A-4. (Contd.)

March										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	139.4	...	122.5	128.7	125.6	129.5	...	109.9	120.9	115.4
2	141.3	120.9	131.9	133.5	128.8	127.3	117.8	109.9	125.6	117.8
3	146.5	120.1	127.2	141.3	129.5	125.6	118.5	108.3	122.5	116.4
4	139.9	124.0	127.2	133.5	128.2	125.6	119.3	108.3	111.5	113.0
5	140.2	120.9	120.9	131.9	124.6	129.2	111.5	108.3	100.5	106.8
6	137.1	113.0	122.5	128.7	121.4	129.5	108.3	103.6	98.9	103.6
7	139.4	120.9	127.2	136.6	128.2	124.2	108.3	117.8	106.8	111.0
8	138.2	120.9	127.2	138.2	128.8	123.2	117.8	111.5	109.9	113.1
9	139.7	...	125.6	136.6	131.1	124.0	...	106.8	102.1	104.5
10	141.3	...	130.3	141.3	135.8	135.0	...	114.6	103.6	109.1
11	146.0	...	124.0	138.2	131.1	130.3	...	116.2	109.9	113.1
12	...	...	131.9	138.2	135.1	...	...	114.6	105.2	109.9
13	...	126.4	131.9	141.3	133.2	...	124.0	116.2	106.8	115.7
14	148.1	128.7	128.7	138.2	131.9	130.3	122.5	117.8	109.9	116.7
15	147.6	124.0	139.7	128.7	130.8	131.1	119.3	113.0	108.3	113.5
16	138.2	122.5	128.7	136.6	129.3	120.9	118.5	113.0	100.5	110.7
17	146.0	126.4	119.3	138.2	128.0	133.5	123.3	111.5	109.9	114.9
18	141.3	125.6	119.3	135.0	126.6	128.7	122.5	111.5	114.6	116.2
19	139.7	129.5	111.5	135.0	125.3	124.8	125.6	100.5	97.3	107.8
20	146.0	129.5	122.5	125.6	125.9	131.9	124.0	103.6	100.5	109.4
21	141.3	122.5	122.5	125.6	123.5	130.3	119.3	103.6	102.1	108.3
22	139.7	122.5	119.3	139.7	127.2	128.7	117.8	105.2	102.1	108.4
23	142.9	122.5	127.2	130.3	126.7	131.1	120.9	124.0	103.6	116.2
24	146.0	122.5	127.2	129.7	126.5	128.7	119.3	111.5	98.9	109.9
25	141.3	126.4	127.2	138.2	130.6	131.1	122.5	113.0	111.5	115.7
26	145.2	132.7	130.3	135.0	132.7	129.5	125.6	114.6	103.6	114.6
27	143.7	127.2	127.2	127.2	127.2	124.0	119.3	108.3	98.6	108.7
28	140.5	124.0	127.2	133.5	128.2	122.5	119.3	114.6	98.9	110.9
29	145.2	127.2	122.5	133.5	127.7	131.1	122.5	113.0	108.4	114.6
30	151.0	124.0	113.0	128.7	121.9	130.3	120.9	98.9	97.3	105.7
31	146.0	122.5	120.9	138.2	127.2	128.7	116.2	105.2	94.2	105.2
Mean	142.7	124.1	125.3	134.3	127.9	128.3	119.4	110.6	105.9	112.0

TABLE A-4. (Contd.)

April										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	143.7	124.0	125.6	135.0	128.2	131.1	120.9	111.5	109.9	114.1
2	139.7	128.0	113.0	133.5	124.8	122.5	120.9	103.6	95.8	106.8
3	139.7	124.0	125.6	141.3	130.3	127.2	109.9	108.3	102.1	106.8
4	142.9	114.6	130.3	125.6	123.5	131.1	106.8	111.5	102.1	106.8
5	144.4	122.5	113.0	125.6	120.4	128.7	106.8	109.9	109.9	108.9
6	156.8	130.3	128.7	122.5	127.2	126.4	122.5	108.3	105.2	112.0
7	150.7	130.3	122.5	130.3	127.7	127.2	125.6	97.3	102.1	108.3
8	137.4	125.6	125.6	128.7	126.6	125.1	120.9	106.8	100.5	109.4
9	144.4	128.0	113.0	133.5	124.8	130.3	120.9	109.9	95.8	108.9
10	...	128.7	124.0	133.5	128.7	...	124.0	109.9	94.2	109.4
11	...	125.6	130.3	128.7	128.2	...	120.9	111.5	103.6	112.0
12	...	123.3	128.7	131.9	128.0	...	117.8	106.8	109.9	111.5
13	...	122.5	130.3	127.2	126.7	...	115.4	113.0	103.6	110.7
14	150.7	124.8	130.3	125.6	126.9	131.9	116.2	113.0	98.9	109.4
15	146.0	124.0	130.3	125.6	126.6	133.1	120.9	113.0	91.1	108.3
16	144.4	124.0	125.6	131.9	127.2	127.2	120.1	109.9	87.9	106.0
17	146.8	124.8	128.7	133.5	129.0	130.3	114.6	109.9	87.9	104.1
18	149.9	125.6	128.7	135.0	129.8	132.7	120.9	111.5	91.1	107.8
19	149.2	125.6	130.3	125.6	127.2	133.5	108.3	111.5	103.6	107.8
20	150.7	120.9	120.9	131.9	124.6	133.5	101.3	106.8	92.6	100.2
21	141.3	127.2	122.5	128.7	126.1	124.8	113.0	102.0	106.8	107.3
22	136.6	127.2	128.7	128.7	128.2	124.0	119.3	109.9	95.8	108.3
23	138.2	128.0	130.3	130.3	129.5	125.6	119.3	109.9	89.5	106.2
24	142.9	131.9	128.7	130.3	130.3	128.7	118.5	111.5	94.2	108.1
25	146.3	131.9	133.5	138.2	134.5	131.9	122.5	117.8	97.3	112.5
26	147.6	127.2	130.3	135.0	130.8	131.9	109.9	116.2	109.9	112.0
27	146.2	119.3	133.5	135.0	129.3	133.5	111.5	113.0	100.5	108.3
28	139.9	125.6	133.5	127.2	128.8	128.7	111.5	117.8	97.3	108.9
29	142.9	131.1	131.9	128.7	130.6	127.5	119.3	116.2	102.1	112.5
30	...	131.9	131.9	133.5	132.4	...	113.0	114.6	103.6	110.4
31	...	...	...	...	...	...	...	...	...	...
Mean	144.7	125.9	122.9	130.9	126.6	129.1	116.4	110.4	99.4	108.7

TABLE A-4. (Contd.)

May										
Date	High values, ppH					Low values, ppH				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	...	135.0	131.9	128.7	131.9	...	111.5	113.8	97.3	107.5
2	...	135.0	124.8	130.3	130.0	...	110.7	112.3	87.9	103.6
3	...	130.3	127.2	130.3	129.3	...	116.2	109.9	94.2	106.8
4	...	126.4	130.3	135.0	130.6	...	108.3	112.3	78.5	99.7
5	146.0	128.0	128.7	135.0	130.6	130.9	107.6	114.6	100.5	107.6
6	155.4	124.0	138.2	135.0	132.4	132.4	108.3	119.3	94.2	107.3
7	155.0	124.0	139.7	128.7	130.8	131.9	105.2	114.6	91.1	103.6
8	155.4	124.0	124.8	135.0	127.9	136.6	106.8	108.3	81.6	98.9
9	154.3	124.0	124.0	144.4	130.8	133.1	106.0	112.3	95.8	104.7
10	144.6	132.7	129.5	139.7	134.0	125.6	109.9	109.2	102.1	107.1
11	139.7	131.1	128.7	147.6	135.8	124.0	119.3	112.3	102.1	111.2
12	139.7	139.0	128.7	138.2	135.3	127.2	117.8	113.0	97.3	109.4
13	139.7	127.2	130.3	135.0	130.8	131.9	113.0	113.8	94.2	107.0
14	144.4	131.0	130.3	131.9	131.1	131.7	113.0	114.6	106.8	111.5
15	146.0	131.9	135.8	135.0	134.2	128.0	117.8	114.6	105.2	112.5
16	144.8	124.0	133.5	142.9	133.5	129.8	110.7	119.3	95.8	108.6
17	143.3	120.9	129.5	135.0	128.5	130.3	100.5	113.8	106.8	107.0
18	144.4	122.5	131.0	135.0	129.5	130.3	108.3	112.3	106.8	109.1
19	146.5	125.6	133.5	135.0	131.4	133.5	109.1	114.6	100.5	108.1
20	146.0	122.5	135.0	139.7	132.4	129.5	105.2	124.0	94.2	107.8
21	144.6	122.5	133.5	138.2	131.4	131.9	98.9	115.4	108.3	107.5
22	142.7	125.6	133.5	138.2	132.4	124.0	105.2	117.0	97.3	106.5
23	142.9	127.2	...	142.9	135.1	124.0	109.9	...	98.9	104.4
24	136.6	128.7	...	...	128.7	122.1	108.3	...	...	108.3
25	136.6	124.0	137.4	...	130.7	123.2	113.0	120.1	...	116.6
26	138.2	124.8	136.6	...	130.7	124.0	111.5	119.3	...	115.4
27	138.9	115.4	136.6	...	126.0	124.0	107.6	117.8	...	112.7
28	135.8	126.4	128.7	...	127.6	130.3	106.8	109.9	...	108.4
29	139.7	130.3	130.3	...	130.3	127.2	113.0	111.5	...	112.3
30	141.3	130.3	127.2	...	128.8	125.6	113.0	109.9	...	111.5
31	140.2	130.3	128.7	...	129.5	128.7	112.3	108.3	...	110.3
Mean	143.8	127.3	131.3	136.4	125.7	128.6	109.8	114.1	97.3	107.1

TABLE A-4. (Contd.)

June										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	143.2	124.0	128.7	141.3	131.3	130.5	111.5	109.9	103.6	108.3
2	149.2	133.5	131.1	133.5	132.7	128.7	114.6	109.9	97.3	107.3
3	143.8	128.7	130.3	136.6	131.9	124.8	109.9	107.6	94.2	103.9
4	141.5	130.3	131.1	138.2	133.2	124.2	111.5	109.9	98.9	106.8
5	142.9	133.5	127.2	139.7	133.5	114.6	113.0	111.5	108.3	110.9
6	139.7	136.6	125.6	141.3	134.5	113.8	114.6	105.2	102.1	107.3
7	139.7	133.5	125.6	141.3	133.5	124.8	111.5	109.9	102.1	107.8
8	141.6	133.5	128.0	142.9	134.8	127.2	109.9	106.8	100.5	105.7
9	145.7	138.2	128.7	141.3	136.1	130.3	117.8	111.5	98.9	109.4
10	155.3	135.0	130.3	141.3	135.5	125.6	114.6	112.3	95.8	107.6
11	142.9	133.5	131.9	141.3	135.6	122.8	113.0	113.0	109.9	112.0
12	142.9	139.7	127.2	136.6	134.5	122.5	111.5	110.7	100.5	107.6
13	143.3	125.6	130.3	136.6	130.8	122.5	105.2	112.3	102.1	106.5
14	142.9	122.5	130.3	139.7	130.8	125.9	103.6	115.4	84.8	101.3
15	142.9	120.9	131.9	144.4	132.4	128.7	103.6	113.8	94.2	103.9
16	145.4	129.5	134.2	141.3	135.0	130.3	102.1	113.0	98.9	104.7
17	145.2	133.5	132.7	142.9	136.4	128.0	111.5	113.8	81.6	102.3
18	...	131.9	129.5	150.7	137.4	...	115.4	113.8	95.8	108.3
19	...	130.7	129.5	141.3	136.8	...	111.5	111.5	95.8	106.3
20	...	135.0	130.3	141.3	135.5	...	111.5	112.3	109.9	111.2
21	...	135.0	130.3	136.6	134.0	...	114.6	112.3	92.6	106.5
22	...	135.8	128.7	136.6	133.7	...	120.9	110.7	89.5	107.0
23	...	135.8	130.3	136.6	134.2	...	118.5	109.9	83.2	103.9
24	...	132.7	129.5	138.2	133.5	...	113.8	113.0	86.4	104.4
25	...	130.3	128.7	141.3	133.4	...	109.1	108.3	83.2	100.2
26	...	131.9	130.3	...	131.1	...	109.9	109.1	...	109.5
27	...	131.9	131.9	...	131.9	...	116.2	109.9	...	113.1
28	...	130.3	128.0	139.7	132.7	...	111.5	109.9	109.9	110.4
29	...	128.7	122.5	141.3	130.8	...	117.0	111.5	91.1	106.5
30	...	130.3	125.6	147.6	134.5	...	114.6	109.9	100.5	108.3
31	...	...	...	...	...	...	...	...	...	...
Mean	144.0	132.0	129.3	140.4	133.9	125.0	112.1	111.0	97.0	106.7

TABLE A-4. (Contd.)

July										
Date	High values, ppH					Low values, ppH				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	138.2	130.3	124.8	147.6	134.2	124.8	111.5	106.0	103.6	107.0
2	137.4	127.2	125.6	144.4	132.4	120.9	108.3	106.8	97.3	104.1
3	142.9	128.0	130.3	146.0	134.0	123.2	105.2	108.3	98.9	104.1
4	145.2	132.7	...	...	132.7	125.6	109.9	...	...	109.9
5	144.4	131.9	...	...	131.9	124.0	113.0	...	...	113.0
6	145.2	131.9	...	144.4	138.2	127.2	110.7	...	113.0	111.9
7	144.4	131.9	127.2	146.0	135.0	127.2	111.5	106.0	98.9	105.5
8	142.9	128.7	128.0	144.4	133.7	127.2	106.8	108.3	97.3	104.1
9	142.9	130.3	128.7	142.9	134.0	125.6	106.8	98.9	91.1	98.9
10	144.4	132.7	130.3	...	131.5	124.0	108.3	109.9	...	109.1
11	153.9	128.7	130.3	147.6	135.5	128.7	106.8	109.9	116.2	111.0
12	144.4	128.7	130.3	150.7	136.6	128.0	97.3	109.9	98.9	102.0
13	141.3	127.2	133.5	152.3	137.7	125.6	103.6	109.9	95.8	103.1
14	142.9	130.3	134.2	153.9	139.5	128.0	106.8	113.0	105.2	108.3
15	144.4	130.3	133.5	153.9	139.5	128.0	113.0	113.8	113.0	113.3
16	146.0	131.9	132.7	...	132.3	130.3	113.0	113.0	...	113.0
17	147.6	131.1	132.7	...	131.9	134.2	109.9	109.9	...	109.9
18	148.4	128.7	129.5	...	129.1	133.5	105.9	108.3	...	107.1
19	146.0	128.7	131.9	...	130.3	131.9	106.0	107.6	...	106.8
20	146.0	130.3	132.7	144.4	135.8	130.3	104.4	108.3	113.0	108.6
21	153.9	132.6	131.1	144.4	136.0	133.5	106.8	108.3	92.6	102.6
22	146.0	133.5	129.5	142.9	135.3	131.9	112.3	111.5	95.8	106.5
23	146.0	133.5	131.9	144.4	136.6	130.3	113.8	109.9	92.6	105.4
24	147.6	134.2	128.7	144.4	135.8	144.2	111.5	112.3	95.8	106.5
25	146.8	132.7	127.2	...	130.0	134.2	111.5	108.3	...	109.9
26	146.8	129.5	117.0	144.4	130.3	131.9	108.3	111.5	116.2	112.0
27	146.0	130.3	127.2	142.9	133.5	134.2	109.9	103.6	98.9	104.1
28	144.4	130.3	134.2	141.3	135.3	132.7	99.7	117.8	97.3	104.9
29	144.4	132.7	136.6	142.9	137.4	131.9	109.9	114.6	97.3	117.3
30	146.0	128.7	136.6	144.4	136.6	131.9	108.3	116.2	97.3	107.3
31	143.7	128.7	134.2	144.4	135.8	130.3	105.2	113.0	97.3	105.2
Mean	145.2	130.6	130.4	145.9	135.6	129.2	108.3	112.7	101.0	107.3

TABLE A-4. (Contd.)

August										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	...	128.0	139.7	146.0	141.8	...	103.6	114.6	108.3	108.8
2	...	120.9	124.0	144.4	129.8	...	105.2	109.9	100.5	105.2
3	...	130.3	131.9	146.0	136.1	...	116.2	108.3	95.8	106.8
4	...	130.3	128.7	146.0	135.0	...	108.3	98.9	97.3	101.5
5	...	129.5	128.7	149.2	135.8	...	106.7	95.8	91.1	97.9
6	...	131.9	125.6	147.6	135.0	...	108.3	109.9	105.2	107.8
7	...	136.6	131.9	...	134.3	...	114.6	95.8	...	105.2
8	...	135.8	133.5	149.2	139.5	...	119.3	106.8	106.8	111.0
9	...	133.5	125.6	135.0	131.4	...	113.0	106.8	116.2	112.0
10	...	133.5	136.6	...	135.1	...	113.0	109.9	...	111.5
11	...	127.2	131.9	...	129.6	...	106.8	109.9	...	108.4
12	...	132.7	131.9	...	132.3	...	109.1	98.9	...	104.0
13	...	108.3	130.3	...	119.3	...	105.2	108.3	...	106.8
14	...	125.6	128.7	...	127.2	...	103.6	106.8	...	105.2
15	...	125.6	130.3	...	128.0	...	108.3	98.9	...	103.6
16	...	131.9	111.5	147.6	130.3	...	113.0	108.3	147.6	123.0
17	...	135.0	130.3	150.7	138.7	...	127.2	113.0	102.1	114.1
18	...	130.3	127.2	146.0	134.5	...	113.0	109.9	116.2	113.0
19	...	125.6	131.9	133.5	130.5	...	106.8	109.9	98.9	105.2
20	...	128.7	131.9	139.7	133.4	...	103.6	108.3	103.6	105.2
21	...	131.9	131.9	...	131.9	...	105.2	113.0	...	109.1
22	...	128.7	133.5	144.4	135.5	...	106.0	113.0	117.8	112.3
23	...	128.0	128.7	146.0	134.2	...	106.0	116.2	114.6	112.3
24	...	130.3	125.6	144.6	133.5	...	106.8	108.3	106.8	107.3
25	...	129.5	128.7	146.0	134.7	...	106.8	113.0	98.9	106.2
26	...	131.9	130.3	147.6	136.6	...	109.9	108.3	98.9	105.7
27	...	133.5	128.7	149.2	137.1	...	112.3	109.9	98.9	107.0
28	...	132.7	128.7	150.7	137.4	...	113.8	108.3	100.5	107.5
29	...	131.9	128.7	150.7	137.1	...	111.5	108.3	125.6	115.1
30	...	133.5	130.3	146.0	136.6	...	108.3	116.2	106.8	110.4
31	...	128.7	131.9	149.2	136.6	...	120.9	108.3	109.9	113.0
Mean	...	129.7	129.7	145.9	135.1	...	110.1	108.1	106.1	108.1

TABLE A-4. (Contd.)

September										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	140.5	128.7	133.5	149.2	137.1	127.2	106.8	108.3	109.9	108.3
2	141.3	129.5	136.6	149.2	138.4	126.4	107.6	113.0	109.9	110.2
3	141.3	128.7	135.0	150.7	138.1	125.6	106.0	113.0	109.9	109.6
4	141.3	131.9	133.5	172.7	146.0	125.6	106.8	113.0	113.0	110.9
5	141.3	131.1	...	153.9	142.5	127.2	107.6	...	114.6	111.1
6	142.9	124.0	...	152.3	138.2	128.7	107.6	...	109.9	108.8
7	141.3	114.6	...	152.3	133.5	132.7	96.6	...	105.2	100.9
8	139.7	111.5	128.7	150.7	130.3	125.6	100.5	113.0	106.8	106.8
9	133.5	125.6	116.2	157.0	133.0	125.6	102.1	109.9	106.8	106.3
10	138.2	127.2	136.6	157.0	140.3	124.0	108.3	113.0	120.9	114.1
11	139.7	124.0	130.3	155.4	136.6	128.0	98.1	111.5	109.9	106.5
12	141.3	126.4	133.5	153.9	137.9	129.5	103.6	109.9	117.8	110.4
13	141.3	126.4	125.6	153.9	135.3	130.3	104.4	116.2	109.9	110.2
14	135.8	128.7	124.0	147.6	133.4	127.2	106.8	114.6	109.9	110.4
15	138.9	119.3	128.7	152.3	133.4	125.6	107.6	117.8	117.8	114.4
16	136.6	124.0	125.6	153.9	134.5	127.2	106.0	108.3	106.8	107.0
17	143.7	124.8	128.7	153.9	135.8	131.1	105.2	111.5	108.3	108.3
18	143.7	127.2	...	157.0	142.1	131.1	104.4	...	108.3	106.4
19	142.9	129.5	...	149.2	139.4	127.2	106.8	...	113.0	109.9
20	141.3	130.3	...	142.9	136.6	128.0	106.8	...	106.8	106.8
21	139.7	128.0	135.0	142.9	135.3	128.7	106.8	117.8	105.2	109.9
22	135.8	126.4	133.5	142.9	134.3	130.3	106.0	113.0	102.0	107.0
23	142.9	124.8	133.5	...	129.2	133.5	103.6	113.0	...	108.3
24	142.9	127.2	127.2	...	127.2	125.6	103.6	114.6	...	109.1
25	144.4	124.8	139.7	...	132.3	131.1	106.8	116.2	...	111.5
26	142.9	124.8	127.2	...	126.0	129.5	103.6	116.2	...	109.9
27	142.9	126.4	131.9	146.0	134.8	128.7	104.4	113.0	125.6	114.3
28	142.9	127.2	131.9	146.0	135.0	129.5	106.8	111.5	111.5	109.9
29	142.9	124.0	133.5	...	128.8	130.3	106.8	120.9	...	113.9
30	142.9	120.1	...	...	120.1	129.5	105.2	...	...	105.2
31	...	...	...	...	...	...	...	...	...	...
Mean	140.9	125.6	130.9	151.8	136.1	128.4	105.1	113.5	110.8	109.8

TABLE A-4. (Contd.)

October										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	144.4	113.8	...	...	113.8	131.1	102.1	...	...	102.1
2	144.4	127.2	...	...	127.2	131.9	105.2	...	...	105.2
3	143.7	124.8	...	146.0	135.4	132.7	110.7	...	125.6	118.2
4	142.9	124.8	135.0	...	129.9	131.9	107.6	117.8	...	112.7
5	142.9	124.0	130.3	...	127.2	130.3	102.1	125.6	...	113.9
6	142.9	120.1	133.5	...	126.8	130.3	102.1	124.0	...	113.1
7	142.9	131.9	131.9	...	131.9	131.1	108.3	109.9	...	109.1
8	144.4	124.8	133.5	...	129.2	139.7	108.3	113.0	...	110.7
9	143.7	124.0	...	...	124.0	132.7	105.2	...	...	105.2
10	141.3	126.4	...	...	126.4	129.5	107.6	...	...	107.6
11	...	124.0	...	155.4	139.7	...	108.3	...	122.5	115.4
12	...	122.5	127.2	157.0	135.6	...	106.8	119.3	111.5	112.5
13	...	118.5	131.9	...	125.2	...	102.1	113.0	...	107.6
14	...	110.7	128.7	...	119.7	...	100.5	109.9	...	105.2
15	137.4	118.5	130.3	...	124.5	131.1	105.2	111.5	...	108.4
16	133.5	119.3	...	...	119.3	128.7	102.1	...	...	102.1
17	135.0	120.1	...	...	120.1	124.0	102.1	...	...	102.1
18	137.4	120.9	131.9	150.7	134.5	124.0	108.3	114.6	122.5	115.1
19	137.4	124.0	127.2	153.9	135.0	128.0	108.3	114.6	122.5	115.1
20	138.2	125.6	130.3	153.9	136.6	127.2	108.3	108.3	116.2	110.9
21	141.3	124.0	125.6	152.3	134.0	129.5	106.8	109.9	113.0	109.9
22	139.7	124.0	...	152.3	138.2	132.7	106.8	...	124.0	115.4
23	138.2	125.6	...	131.9	128.8	130.3	106.8	...	109.9	108.4
24	137.4	127.2	...	...	127.2	125.6	109.9	...	...	109.9
25	142.9	120.9	...	...	120.9	131.1	111.5	...	...	111.5
26	...	124.0	130.3	153.9	136.1	...	108.3	125.6	131.9	121.9
27	...	125.6	124.0	149.2	132.9	...	106.8	103.6	120.9	110.4
28	133.5	123.3	124.0	146.0	131.1	114.6	109.9	109.9	111.5	110.4
29	132.7	122.5	...	...	122.5	119.3	104.4	...	...	104.4
30	136.6	116.2	...	...	116.2	116.2	97.3	...	...	97.3
31	136.6	115.4	...	146.0	130.7	127.2	95.0	...	131.9	113.5
Mean	139.7	122.4	129.7	149.9	134.0	128.4	105.6	114.4	120.3	113.4

TABLE A-4. (Contd.)

November										
Date	High values, pph					Low values, pph				
	1978- 80 Mean	1981	1982	1983	1981- 83 Mean	1978- 80 Mean	1981	1982	1983	1981- 83 Mean
1	138.2	120.9	119.3	146.0	128.7	125.6	102.8	105.2	122.5	110.2
2	137.4	125.6	124.0	147.6	132.4	128.0	109.9	100.5	117.8	109.4
3	138.2	128.7	128.7	150.7	136.0	128.7	109.9	106.8	117.8	111.5
4	138.9	127.2	...	149.2	138.2	131.1	109.9	...	133.5	121.7
5	141.3	125.6	...	...	125.6	131.9	106.8	...	...	106.8
6	142.9	124.0	...	...	124.0	132.7	108.3	...	...	108.3
7	142.9	121.7	...	144.4	133.1	130.3	105.2	...	138.2	121.7
8	142.1	120.9	128.7	147.6	132.4	130.3	105.2	119.3	119.3	114.6
9	145.2	117.8	128.7	...	123.3	131.9	101.3	124.0	...	112.7
10	142.9	120.9	131.9	...	126.4	131.9	102.1	122.5	...	112.3
11	...	122.5	131.9	...	127.2	...	106.8	130.3	...	118.6
12	136.6	127.2	...	...	127.2	133.5	108.3	...	...	108.3
13	138.9	125.6	...	...	125.6	133.5	108.3	...	...	108.3
14	134.2	...	...	146.0	146.0	123.2	...	...	133.5	133.5
15	136.6	...	...	147.6	147.6	131.9	...	...	111.5	111.5
16	138.9	124.0	130.3	153.9	136.1	121.7	109.2	125.6	114.6	116.5
17	139.7	122.5	130.3	155.4	136.1	120.9	108.3	124.0	124.0	118.8
18	128.7	117.8	128.7	147.6	131.4	119.3	100.5	119.3	125.6	115.1
19	138.9	119.3	...	150.7	135.0	121.7	102.1	...	117.8	110.0
20	131.9	119.3	...	155.4	137.4	120.9	103.6	...	135.0	119.3
21	139.7	120.9	...	147.6	134.3	124.0	103.6	...	133.5	118.6
22	135.0	120.9	...	133.5	127.2	128.7	105.2	...	122.5	113.9
23	138.2	127.2	...	147.6	137.4	127.2	105.2	...	114.6	109.9
24	125.6	130.3	...	...	130.3	109.9	109.1	...	...	109.1
25	114.6	129.5	...	...	129.5	109.9	108.3	...	...	108.3
26	117.8	127.2	...	...	127.2	113.1	108.3	...	...	108.3
27	123.2	110.7	...	...	110.7	114.6	108.3	...	...	108.3
28	126.4	111.5	138.2	152.3	134.0	112.3	108.3	128.7	135.0	124.0
29	131.9	116.2	...	152.3	134.3	124.0	102.1	...	136.6	119.4
30	135.0	113.0	...	...	113.0	129.5	98.9	...	...	98.9
31	...	...	...	...	...	...	...	...	...	...
Mean	135.3	122.1	129.2	148.6	133.3	124.9	105.9	118.8	125.2	116.6

TABLE A-4. (Contd.)

December										
Date	High values, pph					Low values, pph				
	1978-80 Mean	1981	1982	1983	1981-83 Mean	1978-80 Mean	1981	1982	1983	1981-83 Mean
1	124.8	113.0	...	...	113.0	122.5	102.1	...	...	102.1
2	125.6	125.6	...	...	125.6	122.5	105.2	...	...	105.2
3	130.3	122.5	...	153.9	138.2	124.0	105.2	...	136.6	120.9
4	133.5	122.5	...	149.2	135.8	126.4	106.0	...	133.5	119.8
5	126.4	120.9	...	149.2	135.1	124.8	105.2	...	124.0	114.6
6	127.2	124.0	...	146.0	135.0	122.5	107.6	...	120.9	114.3
7	125.6	122.5	...	150.7	136.6	113.8	106.8	...	128.7	117.8
8	119.3	127.2	...	150.7	139.0	113.1	107.6	...	131.9	119.8
9	113.1	124.0	...	...	124.0	103.6	108.3	...	...	108.3
10	116.2	122.5	...	...	122.5	103.6	108.3	...	...	108.3
11	122.5	125.6	...	...	125.6	111.5	109.9	...	...	109.9
12	124.0	127.2	...	149.2	138.2	119.3	109.9	...	127.2	118.6
13	120.9	119.3	...	155.4	137.4	114.6	105.2	...	144.4	124.8
14	...	120.9	...	...	120.9	...	103.6	...	...	103.6
15	...	128.7	...	...	128.7	115.4	108.3	...	...	108.3
16	128.7	121.7	...	152.3	137.0	116.2	108.3	...	119.3	113.8
17	128.7	119.3	...	152.3	135.8	124.0	105.2	...	127.2	116.3
18	128.0	117.8	...	149.2	133.5	124.8	105.2	...	128.7	117.0
19	125.6	127.2	...	155.4	141.3	121.7	109.1	...	128.7	118.9
20	124.8	130.3	...	...	130.3	121.7	114.6	...	...	114.6
21	124.0	125.6	136.6	...	131.1	120.9	109.9	116.2	...	113.1
22	124.0	116.2	135.0	...	125.6	121.7	103.6	120.9	...	112.3
23	120.9	118.5	139.7	...	129.1	119.3	102.1	125.6	...	113.9
24	119.3	117.8	117.8	...	117.8	117.0	100.5	109.9	...	105.2
25	120.1	122.5	127.2	...	124.9	117.8	106.8	111.5	...	109.2
26	123.2	127.2	130.3	...	128.8	117.8	109.9	113.0	...	111.5
27	122.5	131.9	119.3	...	125.6	120.9	110.7	114.6	...	112.7
28	124.0	116.2	128.7	142.9	129.3	120.9	106.8	116.2	125.6	116.2
29	121.7	...	128.7	152.3	140.5	118.5	...	114.6	114.6	114.6
30	124.0	...	124.0	...	124.0	119.3	...	111.5	...	111.5
31	127.2	...	131.9	...	131.9	121.7	...	114.6	...	114.6
Mean	124.0	122.8	129.0	150.6	134.1	122.8	106.9	115.3	128.0	116.7

TABLE A-5. Steam Flows in Pounds per Hour (pph) at 8-Inch Well.

January						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	...	396.66	...	...	330.55	...
2	...	372.62	...	...	330.55	...
3	...	336.56	...	...	300.50	...
4	...	360.60	...	...	312.52	...
5	...	396.66	...	...	360.60	...
6	...	372.62	...	...	330.55	...
7	...	360.60	...	...	330.55	...
8	...	396.66	...	...	330.55	...
9	...	420.70	...	...	366.61	...
10	...	432.72	...	...	366.61	...
11	...	444.74	...	...	414.69	...
12	...	426.71	...	...	402.67	...
13	...	414.69	...	...	378.63	...
14	...	432.72	...	...	366.61	...
15	...	426.71	...	...	390.65	...
16	...	420.70	...	...	126.21	...
17	...	240.40	...	...	114.19	...
18	...	240.40	...	...	174.29	...
19	...	126.21	...	...	60.10	...
20	...	120.20	...	...	90.15	...
21	...	126.21	...	...	90.15	...
22	...	150.25	...	...	22.00	...
23
24
25
26	...	258.43	...	...	240.40	...
27	...	240.40	...	...	180.30	...
28	...	240.40	...	...	186.31	...
29	...	186.31	...	...	180.30	...
30	...	180.30	...	...	120.20	...
31	...	192.32	...	...	120.20	...
Mean	...	311.23	...	...	253.06	...

TABLE A-5. (Contd.)

February						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	...	216.36	...	...	180.30	...
2	...	204.34	104.9	...	180.30	55.54
3	...	228.38	98.74	...	180.30	57.60
4	...	216.36	...	...	186.31	...
5	...	258.43	111.08	...	186.31	51.43
6	...	300.50	104.91	...	228.38	61.71
7	...	330.55	92.57	...	294.49	20.57
8	...	324.54	...	...	300.50	...
9	...	354.50	115.19	...	300.50	20.57
10	...	330.55	106.96	...	330.55	20.57
11	...	330.55	113.14	...	306.51	41.14
12	...	336.56	117.25	...	306.51	72.00
13	...	342.57	117.25	...	306.51	61.71
14	...	372.62	127.53	...	318.53	82.28
15	...	354.59	129.59	...	354.59	82.28
16	...	360.60	127.53	...	342.57	74.05
17	...	348.58	133.71	...	318.53	82.28
18	...	336.56	137.82	...	312.52	102.85
19	...	330.55	137.82	...	300.50	94.62
20	...	342.57	150.16	...	300.50	98.74
21	...	348.51	148.10	...	306.51	61.71
22	...	354.59	131.65	...	318.53	82.28
23	...	348.58	127.53	...	312.52	61.71
24	...	342.57	127.53	...	318.53	82.28
25	...	324.54	133.71	...	294.49	102.85
26	...	342.57	133.71	...	294.49	90.51
27	...	330.55	139.88	...	300.50	117.25
28	...	330.55	146.05	...	300.50	123.42
29
30
31
Mean	...	319.39	122.84	...	285.05	73.81

TABLE A-5. (Contd.)

March						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	...	348.58	141.93	...	306.51	127.53
2	...	342.57	160.45	...	306.51	139.88
3	...	342.57	160.45	...	312.52	148.10
4	...	342.57	162.50	...	312.52	146.05
5	...	330.55	168.67	...	312.52	113.14
6	...	324.54	164.56	...	294.49	113.14
7	...	336.56	164.56	...	300.50	94.62
8	...	348.58	148.10	...	324.54	104.91
9	...	336.56	148.10	...	306.51	90.51
10	...	336.56	143.99	...	318.53	69.94
11	...	318.53	78.17	...	312.52	37.03
12	...	330.55	...	...	300.50	...
13	...	330.55	...	...	300.50	...
14	...	342.57	...	...	294.49	...
15	...	318.53	...	...	294.49	...
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
Mean	...	335.36	149.23	...	306.51	107.71

TABLE A-5. (Contd.)

April						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	...	...	...	...	...	...
2	...	...	...	...	...	...
3	...	...	...	...	...	...
4	...	...	...	...	...	...
5	...	...	67.88	...	...	57.60
6	240.40	32.50	65.82	153.26	...	41.14
7	249.42	29.25	78.17	192.32	...	20.57
8	258.43	9.75	86.39	240.40	...	30.86
9	258.43	35.75	111.08	234.39	...	51.43
10	321.54	104.00	111.08	234.39	...	74.05
11	294.49	87.75	98.74	234.39	...	74.05
12	264.44	74.75	104.91	246.41	...	92.57
13	318.53	91.00	109.02	294.49	...	82.28
14	246.41	65.00	129.59	192.32	...	106.96
15	246.41	84.50	139.88	192.32	...	109.02
16	...	74.75	148.10	...	...	113.14
17	...	104.00	152.22	...	...	121.36
18	...	110.58	133.71	...	...	123.42
19	...	117.00	139.88	...	...	123.42
20	...	78.00	135.76	...	...	111.08
21	...	61.75	129.59	...	...	115.19
22	...	97.50	135.76	...	...	115.19
23	...	110.50	139.88	...	...	106.96
24	...	110.50	139.88	...	...	111.08
25	...	123.50	137.82	...	...	111.08
26	...	117.00	137.82	...	...	125.48
27	...	...	135.76	...	...	109.02
28	...	...	131.65	...	...	106.96
29	...	...	133.71	...	...	111.08
30	...	...	137.82	...	...	111.08
31	...	...	141.93	...	...	113.14
Mean	269.85	81.87	122.73	221.47	...	95.16

TABLE A-5. (Contd.)

May						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	240.40	...	133.71	123.21	...	115.19
2	252.42	...	139.88	186.31	...	100.79
3	264.44	...	137.82	192.32	...	...
4	306.51	...	143.99	207.35	...	104.91
5	306.51	...	137.82	240.40	...	117.25
6	...	...	137.82	...	...	113.14
7	...	...	137.82	...	...	106.96
8	...	...	133.71	...	...	82.28
9	...	...	152.22	...	...	...
10	...	...	135.76	...	...	...
11	288.46	...	123.42	198.33	...	...
12	288.48	...	102.85	192.32	...	...
13	276.46	...	113.14	204.34	...	...
14	300.50	...	106.96	240.40	...	...
15	306.51	...	123.42	252.42	...	...
16	312.52	...	133.71	252.42	...	...
17	288.48	...	123.42	204.34	...	...
18	252.42	...	119.31	216.36	...	...
19	264.44	...	133.71	240.40	...	...
20	300.50	...	129.59	222.37	...	...
21	288.48	152.75	143.99	198.33	117.00	...
22	264.44	156.00	156.33	180.30	123.50	...
23	246.41	126.75	156.33	120.20	110.50	...
24	246.41	133.25	139.88	120.20	110.50	...
25	228.38	136.50	...	162.27	97.50	...
26	...	162.50	...	...	104.00	...
27	...	175.50	...	...	133.25	...
28	...	178.75	...	...	156.00	...
29	...	191.75	...	...	162.50	...
30	...	178.75	...	...	143.00	...
31	...	191.75	131.65	...	165.75	...
Mean	276.16	162.20	133.13	197.73	129.41	105.79

TABLE A-5. (Contd.)

June						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	216.36	195.00	102.85	90.15	156.00	...
2	192.32	198.25	98.74	60.10	156.00	...
3	204.34	175.50	111.08	30.05	130.00	...
4	180.30	185.25	129.59	30.05	156.00	...
5	174.29	191.75	159.39	30.05	182.00	...
6	192.32	201.50	152.22	48.08	178.75	...
7	...	182.00	154.28	...	165.75	...
8	...	195.00	143.99	...	139.75	...
9	...	185.25	131.65	...	143.00	...
10	...	182.00	137.82	...	136.50	...
11	...	182.00	137.82	...	143.00	...
12	...	182.00	135.76	...	169.00	...
13	...	191.75	123.42	...	162.50	...
14	...	162.50	127.53	...	149.50	...
15	...	165.75	135.76	...	136.50	...
16	...	165.75	150.16	...	130.00	...
17	...	165.75	150.16	...	143.00	...
18	...	169.00	152.22	...	136.50	...
19	...	172.50	154.28	...	136.50	...
20	...	178.50	152.22	...	136.50	...
21	...	169.00	131.65	...	130.00	...
22	...	159.25	121.36	...	123.50	...
23	...	169.00	121.36	...	123.50	...
24	...	156.00	119.31	...	130.00	...
25	...	182.00	123.42	...	133.25	...
26	...	182.00	127.53	...	130.00	...
27	...	182.00	123.42	...	130.00	...
28	...	175.50	119.31	...	136.50	...
29	...	136.50	127.53	...	130.00	...
30	...	175.50	137.82	...	130.00	...
31	...	...	113.14	...	...	...
Mean	193.32	177.13	132.44	48.08	142.78	...

TABLE A-5. (Contd.)

July						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	...	182.00	113.14	...	162.50	...
2	...	182.00	125.48	...	149.50	...
3	...	175.75	123.42	...	139.75	...
4	...	172.25	131.65	...	143.00	...
5	...	165.75	113.14	...	130.00	...
6	...	162.50	123.42	...	130.00	...
7	276.46	165.75	117.25	228.38	117.00	...
8	294.49	169.00	...	237.40	143.00	...
9	300.50	175.50	...	240.40	123.50	...
10	324.54	172.25	...	240.40	117.00	...
11	318.53	169.00	139.88	240.40	113.75	...
12	318.53	159.25	146.05	222.37	110.50	...
13	288.48	156.00	137.82	216.36	91.00	...
14	288.48	162.50	127.53	222.37	94.25	...
15	282.47	159.25	127.53	228.38	97.50	...
16	288.48	159.25	102.85	228.38	97.50	...
17	291.49	152.75	78.17	216.36	97.50	...
18	282.47	152.75	69.94	204.34	91.00	...
19	288.48	143.00	59.65	204.34	81.25	...
20	288.48	149.50	...	204.34	110.50	...
21	282.47	149.50	106.96	204.34	81.25	...
22	282.47	149.50	113.14	204.34	61.25	...
23	285.48	149.50	104.91	204.34	81.25	...
24	279.47	143.00	98.74	204.34	84.50	...
25	261.44	139.75	78.17	180.30	87.75	...
26	264.44	133.25	61.71	180.30	78.00	...
27	273.46	126.75	59.65	198.33	68.25	...
28	228.38	156.00	51.43	192.32	81.25	...
29	...	159.25	55.54	...	110.50	...
30	...	169.00	74.05	...	126.75	...
31	...	169.00	82.28	...	113.75	...
Mean	285.74	159.04	100.87	213.36	107.56	...

TABLE A-5. (Contd.)

August						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	...	165.75	61.71	...	97.50	...
2	...	136.50	63.77	...	126.75	...
3	240.40	130.00	51.43	198.33	74.75	...
4	273.46	126.75	51.43	180.30	65.00	...
5	252.42	120.25	41.14	150.25	65.00	...
6	...	120.25	69.94	...	65.00	...
7	...	123.50	61.71	...	52.00	...
8	...	123.50	...	...	61.75	...
9	...	...	...	...	...	...
10	192.32	133.25	...	132.22	65.00	...
11	222.37	120.25	...	156.26	52.00	...
12	256.43	...	...	180.30	...	...
13	255.43	104.00	...	180.30	39.00	...
14	...	...	...	...	...	...
15	...	...	...	...	...	...
16	...	...	...	...	...	...
17	186.31	94.25	...	132.22	29.25	...
18	210.35	...	...	144.24	...	...
19	204.34	...	...	144.24	...	...
20	222.37	...	...	144.24	...	...
21	228.38	123.50	...	132.22	45.50	...
22	246.41	...	...	120.20	...	...
23	216.36	...	...	132.22	...	...
24	222.37	...	...	126.21	...	...
25	198.33	...	...	90.15	...	...
26	192.32	...	...	60.10	...	...
27	186.31	...	...	60.10	...	...
28	192.32	...	...	90.15	...	...
29	192.32	...	86.39	90.15	...	...
30	216.36	...	61.71	144.24	...	...
31	156.26	...	37.03	90.15	...	...
Mean	216.63	124.75	58.62	130.85	64.50	...

TABLE A-5. (Contd.)

September						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	186.31	...	...	84.14	...	...
2	204.34	...	...	90.15	...	...
3	192.32	...	...	90.15	...	...
4	186.31	...	...	60.10	...	...
5	216.36	...	...	90.15	...	...
6	174.29	...	...	30.05	...	...
7	150.25	...	...	60.10	...	...
8	186.31	...	...	90.15	...	...
9	168.28	...	...	60.10	...	...
10	138.23	...	...	30.05	...	...
11	...	...	...	...	...	...
12	...	...	...	...	...	...
13	...	...	...	...	...	...
14	...	...	...	...	...	...
15	...	...	...	...	...	...
16	...	...	...	...	...	...
17	...	...	...	...	...	...
18	...	...	...	...	...	...
19	...	...	...	...	...	...
20	...	...	...	...	...	...
21	...	...	...	...	...	...
22	...	...	...	...	...	...
23	...	...	...	...	...	...
24	...	...	...	...	...	...
25	...	...	...	...	...	...
26	...	...	...	...	...	...
27	...	...	...	...	...	...
28	...	...	...	...	...	...
29	...	...	...	...	...	...
30	...	...	...	...	...	...
Mean	180.30	...	...	68.51	...	...

TABLE A-5. (Contd.)

October						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	114.19	...	...	72.12	...	...
2	150.25	...	...	24.04	...	...
3	147.25	...	61.71	24.04	...	...
4	150.25	...	69.94	60.10	...	...
5	...	...	39.08	...	...	...
6	...	...	55.54	...	...	...
7	...	...	39.08	...	...	...
8	...	...	...	...	...	...
9	...	...	32.91	...	...	...
10	...	...	...	...	...	...
11	...	...	61.71	...	...	...
12	...	...	57.60	...	...	...
13	...	...	59.65	...	...	...
14	...	...	...	...	...	...
15	...	...	...	...	...	...
16	...	...	...	...	...	...
17	...	...	133.71	...	...	...
18	...	...	131.65	...	...	...
19	...	...	127.53	...	...	...
20	162.27	...	...	66.11	...	...
21	168.28	...	...	84.14	...	...
22	...	...	...	...	...	...
23	...	...	...	...	...	...
24	...	...	...	...	...	...
25	...	...	...	...	...	...
26	...	...	69.94	...	...	...
27	...	...	65.82	...	...	...
28	...	...	78.17	...	...	...
29	321.54	...	94.62	150.25	...	...
30	...	...	100.79	...	...	...
31	...	...	72.00	...	...	...
Mean	173.43	...	75.08	68.69	...	...

TABLE A-5. (Contd.)

November						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	358.80	...	86.39	320.33	...	51.43
2	336.56	...	94.62	282.47	...	30.86
3	414.69	...	117.25	270.45	...	59.65
4	...	...	121.36	...	...	74.05
5	...	...	119.31	...	...	82.28
6	...	...	115.19	...	...	67.88
7	...	...	115.19	...	...	82.26
8	...	...	94.62	...	...	57.60
9	411.69	...	92.57	381.64	...	26.74
10	378.63	...	111.08	372.62	...	69.94
11	...	...	115.19	...	...	78.17
12	...	...	135.76	...	...	76.11
13	...	...	141.93	...	...	106.96
14	...	...	135.76	...	...	88.45
15	...	...	139.88	...	...	96.68
16	447.75	...	148.10	426.71	...	100.79
17	444.74	98.69	166.62	408.68	30.84	127.53
18	...	...	168.67	...	...	146.05
19	...	111.02	170.73	...	51.40	143.99
20	...	...	174.85	...	...	160.45
21	...	133.64	170.73	...	30.84	156.33
22	...	137.75	176.90	...	51.40	156.33
23	459.77	133.64	185.13	435.73	102.80	158.39
24	453.76	137.75	187.19	426.71	61.68	181.02
25	...	133.64	189.24	...	61.68	172.79
26	...	135.70	195.42	...	61.68	176.90
27	...	135.70	...	...	61.68	...
28	...	150.09	213.93	...	100.74	199.53
29	...	154.20	209.81	...	111.02	191.30
30	...	148.03	207.76	...	102.80	189.24
31	...	...	...	...	...	...
Mean	411.82	134.15	148.32	369.48	69.05	114.13

TABLE A-5. (Contd.)

December						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	...	137.75	211.87	...	96.63	193.36
2	...	148.03	203.64	...	90.46	187.19
3	...	150.09	195.42	...	96.63	183.07
4	...	150.09	201.59	...	104.86	176.90
5	...	154.20	209.81	...	98.69	189.24
6	...	154.20	213.93	...	111.02	195.42
7	...	156.26	215.59	...	117.19	201.59
8	...	160.37	215.70	...	125.42	205.70
9	...	154.20	211.87	...	123.36	197.47
10	...	127.47	207.76	...	113.08	185.13
11	...	148.03	197.47	...	104.86	187.19
12	...	150.09	205.70	...	104.86	185.13
13	...	158.31	205.70	...	113.08	191.30
14	...	178.87	201.59	...	143.92	174.85
15	...	182.98	195.42	...	152.14	168.67
16	...	189.15	191.30	...	162.42	162.50
17	...	193.26	191.30	...	158.31	166.62
18	...	193.26	197.47	...	164.48	172.79
19	...	191.21	201.59	...	168.59	181.02
20	...	191.21	199.53	...	170.65	183.07
21	...	180.93	207.76	...	164.48	174.85
22	...	182.98	211.87	...	168.59	189.24
23	...	185.04	197.47	...	180.93	189.24
24	...	185.04	...	...	170.65	...
25	228.38	189.15	...	126.21	176.82	...
26	288.48	...	...	192.32	...	...
27	339.57	...	...	252.42	...	...
28	276.46	...	156.82	264.44	...	137.82
29	164.56	...	...	133.71
30	170.73	...	...	141.93
31	174.85	...	...	148.10
Mean	283.22	167.69	198.46	208.85	135.28	177.89

TABLE A-6. Steam Flows in Pounds per Hour (pph)
at Schober's Resort.

January						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	3.91	...	...	3.12	...	...
2	3.41	...	...	3.16	...	...
3	3.33	...	3.90	3.16	...	3.58
4	3.41	...	3.95	3.08	...	3.47
5	3.33	...	3.90	3.16	...	3.47
6	3.28	...	3.95	3.16	...	3.53
7	4.07	...	3.90	2.45	...	3.47
8	4.07	...	4.11	1.75	...	3.63
9	3.33	...	3.90	3.08	...	3.58
10	3.28	...	3.90	2.99	...	3.47
11	3.24	...	3.95	3.08	...	3.58
12	3.33	...	4.00	3.12	...	3.58
13	3.24	...	4.05	3.08	...	3.53
14	3.33	...	4.05	3.12	...	3.58
15	3.33	...	4.16	3.16	...	3.69
16	3.28	...	4.32	3.16	...	4.00
17	3.60	...	4.16	3.08	...	3.74
18	3.20	...	...	2.99	...	...
19	3.33	...	...	3.04	...	...
20	3.33	...	...	2.95	...	...
21	3.16	...	...	2.83	...	...
22	3.33	...	...	3.16	...	...
23	3.24	...	...	2.99	...	...
24	3.24	...	...	2.99	...	...
25	3.49	...	3.84	3.08	...	3.42
26	3.49	...	4.16	3.16	...	3.74
27	3.33	...	4.42	2.99	...	3.69
28	3.28	...	4.16	3.08	...	3.53
29	3.24	...	4.21	3.08	...	3.58
30	3.24	...	3.95	2.91	...	3.58
31	3.33	...	3.74	2.99	...	3.63
Mean	3.37	...	4.03	3.00	...	3.59

TABLE A-6. (Contd.)

February						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	2.99	...	3.95	2.74	...	3.53
2	3.08	...	4.11	2.74	...	3.84
3	2.99	...	4.00	2.58	...	3.79
4	3.08	...	3.90	2.58	...	3.63
5	3.16	...	3.84	2.74	...	3.53
6	3.08	...	3.79	2.74	...	3.37
7	3.08	...	3.95	2.83	...	3.58
8	4.95	...	4.11	2.83	...	3.42
9	3.24	...	4.11	2.49	...	3.63
10	3.16	...	3.84	2.00	...	3.37
11	2.83	...	3.79	2.49	...	3.21
12	2.83	...	3.79	2.49	...	3.21
13	2.91	...	3.95	2.62	...	3.58
14	2.91	...	3.90	2.49	...	3.63
15	3.08	...	3.84	2.49	...	3.74
16	3.58	...	4.05	0.42	...	3.63
17	4.20	...	4.00	3.16	...	3.63
18	4.32	...	4.00	3.91	...	3.21
19	4.41	...	4.26	4.03	...	3.84
20	4.45	...	3.84	4.03	...	3.53
21	4.32	...	4.00	3.91	...	3.53
22	4.45	...	4.11	3.91	...	3.69
23	4.49	...	4.21	3.99	...	3.95
24	4.53	...	4.32	4.07	...	4.05
25	4.41	...	4.37	3.99	...	4.05
26	4.37	...	4.63	3.99	...	3.74
27	4.45	...	4.05	3.95	...	3.63
28	4.32	...	4.00	3.91	...	3.69
29	...	...	...	...	...	...
30	...	...	...	...	...	...
31	...	...	...	...	...	...
Mean	3.70	...	4.03	3.08	...	3.62

TABLE A-6. (Contd.)

March						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	4.16	...	4.32	3.99	...	4.05
2	4.32	...	4.21	3.95	...	3.84
3	4.41	...	4.32	3.99	...	3.95
4	4.41	...	4.05	3.91	...	3.69
5	4.32	...	3.95	3.99	...	3.47
6	4.07	...	3.84	3.99	...	3.42
7	4.32	...	4.00	3.91	...	3.63
8	5.16	...	4.05	2.83	...	3.74
9	5.32	...	4.16	3.99	...	3.63
10	4.45	...	4.32	4.11	...	3.84
11	4.32	...	4.11	3.99	...	3.84
12	4.32	...	4.21	3.99	...	3.79
13	4.32	...	4.26	3.99	...	3.95
14	4.24	...	4.21	3.87	...	3.84
15	4.24	...	3.95	3.91	...	3.63
16	4.20	...	4.16	3.99	...	3.63
17	4.24	...	4.48	3.99	...	4.11
18	4.24	...	4.42	3.91	...	4.11
19	4.16	...	4.00	3.99	...	3.63
20	4.20	...	4.69	3.91	...	3.69
21	4.16	...	4.32	3.91	...	4.05
22	4.49	...	4.16	3.58	...	3.69
23	4.37	...	4.16	3.99	...	3.58
24	4.24	...	4.37	3.99	...	4.05
25	4.41	...	4.11	3.99	...	3.74
26	3.99	...	4.05	3.99	...	3.53
27	4.24	...	4.26	4.24	...	3.79
28	4.24	...	4.16	4.24	...	3.84
29	4.37	...	4.21	4.37	...	3.95
30	4.32	...	4.32	4.32	...	3.63
31	4.16	...	4.37	4.16	...	3.69
Mean	4.34	...	4.20	3.89	...	3.78

TABLE A-6. (Contd.)

April						
Date	High values, ppH			Low values, ppH		
	1981	1982	1983	1981	1982	1983
1	4.24	...	4.32	3.99	...	3.69
2	4.24	...	4.69	3.83	...	4.11
3	4.66	...	4.37	3.95	...	4.05
4	...	...	4.21	...	...	4.00
5	...	...	4.26	...	...	3.90
6	4.66	...	4.32	4.32	...	3.90
7	4.66	...	4.48	4.28	...	3.84
8	4.57	...	4.48	4.20	...	3.95
9	4.57	...	4.26	4.24	...	4.16
10	4.66	...	4.48	4.24	...	4.37
11	4.62	...	4.42	4.24	...	4.16
12	4.57	...	4.21	4.16	...	3.95
13	4.57	...	4.32	3.58	...	3.90
14	4.86	...	4.37	4.24	...	3.95
15	4.91	...	4.53	4.49	...	3.90
16	4.95	...	4.79	4.45	...	4.21
17	4.95	...	4.58	4.57	...	4.11
18	4.91	...	4.63	4.66	...	3.90
19	4.74	...	...	4.45	...	...
20	4.86	...	...	4.41	...	...
21	5.03	...	...	4.57	...	...
22	5.11	...	...	4.70	...	...
23	5.28	...	...	4.66	...	...
24	5.36	...	...	4.78	...	...
25	5.28	...	...	4.78	...	...
26	5.28	...	...	4.74	...	...
27	5.32	...	...	4.57	...	...
28	5.32	...	...	4.74	...	...
29	5.49	...	...	4.99	...	...
30	5.65	...	...	4.57	...	...
31	...	...	...	...	...	...
Mean	4.90	...	4.43	4.41	...	4.00

TABLE A-6. (Contd.)

May						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	5.74	...	...	5.03	...	...
2	5.57	...	...	4.99	...	...
3	5.41	...	4.79	4.91	...	4.11
4	5.36	...	4.84	4.78	...	4.48
5	5.32	...	4.84	4.82	...	4.37
6	5.32	...	4.53	4.78	...	4.11
7	5.32	...	4.79	4.74	...	4.16
8	5.49	...	5.05	4.82	...	4.42
9	5.49	...	4.95	4.82	...	4.63
10	5.57	...	4.90	4.91	...	4.53
11	5.53	...	4.63	4.95	...	4.26
12	5.53	...	4.84	4.86	...	4.32
13	5.49	...	4.74	4.82	...	4.32
14	5.65	...	4.69	4.82	...	4.21
15	5.45	...	4.95	4.82	...	4.37
16	5.49	...	4.74	4.57	...	4.48
17	5.41	...	4.69	4.74	...	4.21
18	5.41	...	5.00	4.78	...	4.37
19	5.49	...	4.79	4.45	...	4.48
20	5.24	...	4.84	4.74	...	4.32
21	5.36	...	5.00	4.66	...	4.48
22	5.45	...	...	4.74	...	...
23	5.36	...	...	4.82	...	...
24	5.32	...	...	4.66	...	...
25	5.16	...	...	4.70	...	...
26	5.16	...	...	4.57	...	...
27	4.74	...	...	4.49	...	...
28	5.24	...	...	4.49	...	...
29	5.16	...	...	4.41	...	...
30	5.20	...	...	4.91	...	...
31	5.07	...	4.90	4.24	...	4.26
Mean	5.37	...	4.83	4.74	...	4.34

TABLE A-6. (Contd.)

June						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	5.16	...	5.05	4.16	...	4.63
2	5.16	...	4.74	4.24	...	4.37
3	5.07	...	4.90	4.16	...	4.37
4	5.11	...	4.90	4.32	...	4.42
5	4.99	...	4.90	4.07	...	4.42
6	5.20	...	5.00	4.07	...	4.79
7	5.07	...	4.79	4.16	...	4.63
8	5.11	...	5.05	4.16	...	4.58
9	5.11	...	5.00	4.32	...	4.48
10	5.11	...	4.90	3.91	...	4.48
11	4.99	...	5.11	4.16	...	4.95
12	4.86	...	4.95	4.16	...	4.48
13	5.53	...	4.90	3.99	...	4.58
14	4.28	...	5.05	3.78	...	4.42
15	4.66	...	5.16	3.83	...	4.58
16	5.53	...	5.05	3.74	...	4.58
17	4.91	...	5.11	4.07	...	4.58
18	4.82	...	5.16	3.66	...	4.69
19	4.74	...	5.16	3.49	...	4.58
20	4.66	...	5.16	3.24	...	4.90
21	4.57	...	4.95	3.24	...	4.48
22	4.57	...	4.95	2.83	...	4.42
23	4.49	...	5.05	3.58	...	4.53
24	4.41	...	5.11	2.74	...	4.58
25	4.37	...	5.16	3.16	...	4.63
26	4.41	...	5.11	2.91	...	4.63
27	4.32	...	5.11	3.16	...	4.79
28	4.24	...	5.16	2.99	...	4.58
29	4.32	...	5.27	3.16	...	4.79
30	4.32	...	5.11	3.45	...	4.74
31	...	...	...	...	...	...
Mean	4.80	...	5.03	3.70	...	4.59

TABLE A-6. (Contd.)

July						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	5.16	...	...	4.69
2	5.00	...	...	4.53
3	4.79	...	...	4.48
4	4.79	...	...	4.58
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20	5.00	...	...	4.48
21	5.05	...	...	4.48
22	5.11	...	...	4.53
23	5.05	...	...	4.48
24	5.11	...	...	4.58
25	5.00	...	...	4.90
26	5.00	...	...	4.58
27	4.95	...	...	4.53
28	4.95	...	...	4.42
29	4.79	...	...	4.48
30	5.00	...	...	4.48
31	5.11	...	...	4.53
Mean	4.99	...	...	4.54

TABLE A-6. (Contd.)

August						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	5.05	...	...	4.74
2	5.11	...	...	4.53
3	5.11	...	...	4.53
4	5.11	...	...	4.53
5	5.11	...	...	4.48
6	5.16	...	...	4.63
7	5.16	...	...	4.69
8	5.21	...	...	4.74
9	4.95	...	...	4.63
10	5.05	...	...	4.63
11	5.05	...	...	4.53
12	5.11	...	...	4.58
13	5.11	...	...	4.58
14	5.11	...	...	4.79
15	5.00	...	...	4.58
16	5.16	...	...	4.63
17	5.11	...	...	4.58
18	5.11	...	...	4.74
19	4.84	...	...	4.48
20	5.00	...	...	4.58
21
22	5.05	...	...	4.79
23	5.05	...	...	4.58
24	4.95	...	...	4.58
25	4.95	...	...	4.42
26	5.05	...	...	4.53
27	5.05	...	...	4.48
28	5.11	...	...	4.58
29	4.90	...	...	4.58
30	5.05	...	...	4.84
31	5.00	...	...	4.58
Mean	5.06	...	...	4.61

TABLE A-6. (Contd.)

September						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	5.11	...	...	4.63
2	5.16	...	...	4.69
3	5.21	...	...	4.74
4	5.11	...	...	4.74
5	5.00	...	...	4.63
6	5.16	...	...	4.74
7	5.16	...	...	4.63
8	5.05	...	...	4.63
9	5.00	...	...	4.58
10	5.00	...	...	4.42
11	5.11	...	...	4.53
12	5.11	...	...	4.79
13	5.05	...	...	4.48
14	5.11	...	...	4.58
15	5.21	...	...	4.58
16	5.21	...	...	4.63
17	5.16	...	...	4.63
18	5.21	...	...	4.58
19	5.16	...	...	4.63
20	5.11	...	...	4.74
21	5.05	...	...	4.74
22	4.79	...	...	4.48
23	4.74	...	...	4.21
24	4.79	...	...	4.63
25	4.79	...	...	4.58
26	4.90	...	...	4.53
27	5.11	...	...	4.74
28	5.16	...	...	4.90
29	5.05	...	...	4.84
30	4.90	...	...	4.69
31
Mean	5.05	...	...	4.63

TABLE A-6. (Contd.)

October						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	4.79	...	...	4.48
2	4.84	...	...	4.48
3	4.69	...	...	4.42
4	4.84	...	...	4.69
5	4.90	...	...	4.42
6	4.84	...	...	4.48
7	5.11	...	...	4.48
8	4.90	...	...	4.63
9	4.90	...	...	4.53
10	4.90	...	...	4.32
11	4.74	...	...	4.48
12
13	5.05	...	...	4.48
14	5.21	...	...	4.95
15	4.95	...	...	4.63
16	4.84	...	...	4.53
17	4.90	...	...	4.53
18	4.95	...	...	4.63
19	4.90	...	...	4.58
20	5.00	...	...	4.63
21	4.90	...	...	4.53
22	4.79	...	...	4.37
23	4.90	...	...	4.48
24	5.11	...	...	4.69
25	4.69	...	...	4.53
26	4.79	...	...	4.53
27	4.90	...	...	4.63
28	4.79	...	...	4.42
29	4.84	...	...	4.48
30	4.90	...	...	4.63
31	4.79	...	...	4.58
Mean	4.89	...	...	4.54

TABLE A-6. (Contd.)

November						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	4.95	...	...	4.42
2	5.00	...	...	4.58
3	4.84	...	...	4.48
4	4.90	...	...	4.74
5
6
7	5.05	...	...	4.74
8	4.74	...	...	4.37
9	4.79	...	...	4.42
10	5.00	...	...	4.53
11	4.95	...	...	4.69
12	4.90	...	...	4.53
13	5.16	...	...	4.32
14	4.58	...	...	4.26
15	4.84	...	...	4.37
16	4.95	...	...	4.58
17	5.16	...	...	4.74
18	4.79	...	...	4.48
19	5.05	...	...	4.42
20	5.32	...	...	4.90
21
22
23
24
25
26
27
28	4.95	...	...	4.26
29	4.84	...	...	4.53
30	4.84	...	...	4.58
31
Mean	4.93	...	...	4.52

TABLE A-6. (Contd.)

December						
Date	High values, pph			Low values, pph		
	1981	1982	1983	1981	1982	1983
1	4.90	...	...	4.63
2	4.84	...	...	4.58
3	5.00	...	...	4.69
4	4.53	...	...	4.32
5	4.48	...	...	3.79
6	4.58	...	...	4.26
7	4.69	...	...	4.26
8	4.79	...	...	4.48
9	4.95	...	...	4.53
10	4.63	...	...	4.16
11	4.84	...	...	4.48
12	4.48	...	...	4.32
13	4.69	...	...	4.32
14	4.84	...	...	4.37
15	4.84	...	...	4.53
16	4.84	...	...	4.32
17	4.79	...	...	4.32
18	5.00	...	...	4.26
19
20
21
22
23
24
25
26
27
28
29
30
31
Mean	4.76	...	...	4.37

TABLE A-7. Steam Flows From Manometer
Readings at Schober's Resort.

Date, 1983	Manometer reading, cm	Flow, pph	Flow, pph/in ²
1-9	27.2	5.45	173.5
1-17	27.2	5.45	173.5
1-24	27.2	5.45	173.5
1-31	27.3	5.46	173.8
2-7	27.3	5.46	173.8
2-14	27.5	5.48	174.5
2-22	27.0	5.43	172.9
2-28	26.1	5.33	170.0
3-8	26.3	5.36	170.6
3-16	26.9	5.42	172.6
3-21	27.0	5.43	172.9
3-28	27.0	5.43	172.9
4-4	27.4	5.47	174.2
4-11	27.8	5.51	175.4
4-18	26.8	5.41	172.2
4-25	27.0	5.43	172.9
5-2	26.5	5.38	171.3
5-9	26.2	5.12	163.0
5-16	26.5	5.38	171.3
6-13	26.5	5.38	171.3
6-27	26.4	5.37	170.9
7-5	26.3	5.36	170.6
7-11	26.4	5.37	170.9
7-20	26.3	5.36	170.6
7-25	26.8	5.41	172.2
8-1	26.6	5.38	171.6
8-8	26.7	5.40	171.9
8-22	25.4	5.27	167.7
8-29	26.7	5.38	171.6
9-6	26.8	5.41	172.2
9-12	26.7	5.38	171.6
9-19	26.6	5.38	171.6
9-27	26.8	5.41	172.2
10-3	26.5	5.38	171.3
10-11	26.6	5.38	171.6
10-17	26.7	5.38	171.6
10-25	26.8	5.41	172.2
10-31	26.6	5.38	171.6
11-7	27.6	5.49	174.8
11-14	27.8	5.51	175.4

NWC TP 6558

Appendix B

DAILY STEAM WELL TEMPERATURE DATA



TABLE B-1. Two-Inch Well Temperature, °F.

January						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	209	194	...	198	178	...
2	208	202	205	198	183	204
3	209	206	212	196	197	202
4	208	205	218	188	183	204
5	207	205	214	185	182	200
6	205	203	214	186	183	201
7	205	...	213	195	...	206
8	208	...	207	201	...	195
9	208	...	211	190	...	186
10	208	...	209	200	...	190
11	205	202	210	196	191	197
12	205	204	211	190	183	203
13	206	209	...	195	199	...
14	209	211	211	200	200	201
15	210	210	211	185	199	202
16	200	211	212	195	192	180
17	207	204	207	201	192	182
18	210	204	209	201	178	186
19	208	202	193	199	180	174
20	209	194	198	195	180	178
21	209	199	207	200	182	198
22	207	205	204	203	191	198
23	203	216	205	180	204	198
24	203	211	203	200	201	168
25	204	...	209	190	...	198
26	204	204	206	200	185	192
27	195	210	200	172	198	177
28	205	206	208	173	160	200
29	203	204	207	168	180	186
30	204	210	207	192	199	192
31	199	210	...	191	199	...
Mean	205.8	205.4	207.9	192.4	188.4	192.8

TABLE B-1. (Contd.)

February						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	209	204	209	193	199	201
2	207	208	206	200	202	184
3	207	210	204	199	192	166
4	209	204	208	199	174	199
5	206	204	207	194	197	202
6	200	206	206	190	198	200
7	205	210	206	199	193	176
8	205	209	206	190	199	202
9	204	209	209	178	197	202
10	204	203	208	199	193	202
11	207	208	210	195	198	200
12	207	209	210	198	199	204
13	207	209	...	200	198	...
14	207	209	210	188	202	206
15	207	209	209	200	194	205
16	209	209	210	198	202	204
17	207	210	209	195	185	204
18	205	206	205	199	196	199
19	205	209	206	187	203	187
20	200	210	208	184	204	204
21	204	211	206	194	198	205
22	210	210	210	199	198	190
23	210	207	205	179	196	190
24	195	210	206	175	202	201
25	209	210	205	170	199	200
26	...	210	205	...	199	187
27	...	210	...	...	198	...
28	...	211	204	...	200	204
Mean	205.8	208.4	207.4	192.2	197.0	197.1

TABLE B-1. (Contd.)

March						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	...	...	210	...	...	205
2	203	205	191	184	175	178
3	204	205	190	180	195	180
4	200	205	203	163	195	186
5	204	205	210	198	185	204
6	207	206	209	201	196	197
7	208	...	210	194	...	207
8	207	206	204	198	196	194
9	210	205	210	190	195	193
10	...	205	210	...	195	202
11	...	200	208	...	173	206
12	205	204	211	195	185	198
13	205	206	210	170	187	205
14	205	194	205	198	168	192
15	209	208	203	198	186	189
16	210	203	208	193	187	173
17	207	203	209	198	173	179
18	205	205	205	185	174	186
19	205	204	208	170	196	190
20	204	208	207	172	197	193
21	205	203	206	200	201	199
22	209	204	208	205	202	197
23	205	204	209	176	196	203
24	208	208	206	198	201	190
25	208	209	198	190	190	186
26	204	204	204	171	194	189
27	204	204	205	180	202	201
28	205	204	208	190	168	196
29	207	198	204	181	174	181
30	205	203	205	175	195	200
31	209	204	210	199	192	205
Mean	206.0	204.2	205.9	187.6	188.0	193.7

TABLE B-1. (Contd.)

April						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	205	194	205	178	180	199
2	202	194	206	180	192	203
3	205	209	210	195	198	189
4	209	194	208	203	192	184
5	209	202	207	199	198	187
6	209	203	203	185	181	185
7	206	204	206	185	198	196
8	207	202	208	203	205	199
9	208	210	209	199	202	204
10	209	210	206	198	198	200
11	208	202	206	198	194	201
12	208	210	204	198	198	183
13	209	205	205	205	198	185
14	209	205	207	205	190	187
15	210	205	206	203	196	203
16	210	205	206	200	190	204
17	210	206	210	201	200	203
18	199	206	210	186	205	205
19	205	206	204	200	195	200
20	206	205	209	195	186	198
21	209	201	207	189	185	200
22	208	205	206	190	191	198
23	210	206	210	201	200	201
24	209	206	209	204	196	200
25	210	206	207	199	196	204
26	208	205	205	186	200	201
27	202	206	206	184	200	204
28	205	206	209	187	185	203
29	209	206	209	195	190	200
30	209	210	208	203	201	200
Mean	207.4	204.5	207.0	195.1	194.7	197.6

TABLE B-1. (Contd.)

May						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	208	206	207	198	200	198
2	208	...	210	185	...	204
3	209	...	210	181	...	206
4	210	206	209	195	195	202
5	207	205	206	198	190	200
6	209	210	208	195	191	203
7	209	210	209	203	190	203
8	209	206	211	198	180	203
9	209	205	211	205	185	204
10	210	205	206	193	195	189
11	210	201	206	198	185	180
12	210	210	210	203	195	180
13	208	205	206	199	200	203
14	209	205	210	179	186	189
15	208	206	210	184	185	186
16	207	206	210	183	195	200
17	208	206	210	188	195	201
18	207	205	209	200	185	204
19	205	205	210	180	195	180
20	204	210	209	183	201	206
21	206	205	210	204	200	198
22	209	210	210	200	195	201
23	209	...	210	204	...	205
24	210	...	...	201	...	...
25	208	205	...	198	200	...
26	208	210	...	200	195	...
27	209	205	...	199	186	...
28	209	205	...	194	200	...
29	208	206	...	196	200	...
30	208	205	...	204	200	...
31	209	206	...	199	200	...
Mean	208.3	206.2	209.0	195.1	193.4	197.6

TABLE B-1. (Contd.)

June						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	210	205	216	201	200	199
2	208	206	217	193	200	200
3	210	205	217	193	200	206
4	210	210	217	193	200	200
5	210	205	218	203	195	201
6	210	206	210	203	200	204
7	210	205	211	205	200	197
8	210	205	210	199	195	206
9	203	206	210	191	201	201
10	202	210	210	196	200	205
11	203	205	209	194	201	200
12	202	206	211	195	200	205
13	203	205	210	188	195	206
14	195	...	210	185	...	202
15	200	210	210	180	195	206
16	205	210	210	165	200	200
17	203	210	211	174	175	205
18	205	206	212	195	190	205
19	205	205	210	200	191	206
20	205	210	210	197	205	204
21	205	210	210	200	200	204
22	205	210	210	200	205	204
23	205	210	210	195	200	206
24	205	210	211	199	200	204
25	205	210	210	200	201	203
26	204	210	...	199	200	...
27	205	210	...	199	201	...
28	205	205	211	195	200	206
29	204	205	211	199	186	204
30	205	205	210	190	190	180
Mean	205.2	207.4	211.5	194.2	197.4	202.5

TABLE B-1. (Contd.)

July						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	205	206	210	200	201	201
2	202	205	210	199	200	202
3	204	210	211	195	200	200
4	205	...	...	200	...	...
5	206	...	...	199	...	...
6	205	206	210	198	200	206
7	205	205	213	195	201	205
8	205	206	211	199	200	204
9	204	210	211	199	205	206
10	205	210	...	200	200	...
11	205	210	210	195	201	205
12	204	205	215	197	200	206
13	204	210	216	197	206	206
14	204	210	214	200	205	187
15	205	210	211	195	205	182
16	205	210	...	201	205	...
17	204	210	...	197	200	...
18	204	210	...	195	201	...
19	205	210	...	200	200	...
20	205	210	210	195	200	204
21	205	210	213	195	201	205
22	204	210	212	200	205	204
23	205	210	211	200	200	202
24	205	210	210	196	200	196
25	204	210	...	199	201	...
26	213	205	210	204	200	198
27	211	210	210	205	186	204
28	211	210	210	206	200	204
29	210	210	210	204	200	204
30	210	210	211	201	200	205
31	210	210	211	201	205	201
Mean	205.8	208.9	211.3	198.9	201.0	201.6

TABLE B-1. (Contd.)

August						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	205	216	211	195	194	206
2	205	212	214	198	204	206
3	202	210	212	195	198	210
4	202	210	215	198	199	207
5	205	212	214	199	200	206
6	205	216	212	201	204	204
7	206	210	...	201	198	...
8	204	210	210	190	203	204
9	205	211	211	200	203	203
10	210	208	...	194	203	...
11	205	210	...	193	201	...
12	205	211	...	175	204	...
13	205	210	...	202	205	...
14	204	211	...	193	202	...
15	205	212	...	201	203	...
16	205	210	210	201	206	207
17	203	212	210	200	204	187
18	205	211	208	198	204	190
19	205	211	210	199	204	197
20	205	216	210	195	210	207
21	205	216	...	195	204	...
22	205	217	209	195	210	194
23	204	213	210	195	197	204
24	205	211	210	195	204	204
25	205	213	211	200	210	205
26	205	211	212	202	204	204
27	205	212	210	199	204	190
28	203	216	212	201	198	191
29	205	211	212	199	204	190
30	207	211	211	190	208	187
31	200	211	210	193	199	180
Mean	204.7	211.8	211.2	196.5	202.9	199.4

TABLE B-1. (Contd.)

September						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	205	214	210	195	204	180
2	204	212	209	197	204	189
3	206	212	212	195	204	190
4	205	214	207	188	210	196
5	203	...	210	188	...	184
6	203	...	206	189	...	196
7	203	...	213	185	...	194
8	204	210	212	188	208	206
9	204	211	211	195	205	190
10	204	192	212	192	174	191
11	205	212	207	187	210	189
12	205	211	210	195	192	196
13	204	206	210	194	185	194
14	204	204	210	185	199	192
15	210	208	212	195	180	194
16	212	209	212	200	205	196
17	212	210	211	206	198	196
18	212	...	211	208	...	194
19	212	...	210	205	...	196
20	211	...	210	204	...	189
21	210	210	210	203	203	197
22	211	211	209	203	203	180
23	210	212	...	202	204	...
24	210	210	...	204	199	...
25	210	210	...	199	174	...
26	210	204	...	205	180	...
27	210	210	191	203	192	189
28	210	210	191	200	191	189
29	208	210	...	203	190	...
30	209	...	...	190	...	...
Mean	207.5	209.2	208.6	196.8	196.2	192.0

TABLE B-1. (Contd.)

October						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	206	...	...	185	...	...
2	209	...	...	200	...	...
3	205	...	210	187	...	204
4	209	204	...	201	174	...
5	209	210	...	202	157	...
6	210	198	...	201	158	...
7	209	210	...	183	186	...
8	210	208	...	200	186	...
9	210	...	...	200	...	...
10	208	...	...	179	...	...
11	207	...	208	180	...	192
12	206	204	210	183	195	181
13	206	210	...	198	198	...
14	204	211	...	181	202	...
15	206	210	...	181	203	...
16	209	...	...	189	...	...
17	206	...	...	189	...	...
18	206	210	203	195	204	188
19	209	204	212	191	198	197
20	205	210	210	201	202	200
21	209	210	212	201	204	176
22	209	...	200	187	...	187
23	211	...	212	191	...	197
24	208	...	...	190	...	...
25	209	...	209	201	...	200
26	210	197	206	199	158	192
27	209	204	210	199	186	196
28	206	204	210	177	202	200
29	181	...	...	176	...	...
30	210	...	...	190	...	...
31	205	...	203	191	...	196
Mean	207.0	206.2	208.2	191.2	186.6	193.3

TABLE B-1. (Contd.)

November						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	204	204	209	199	192	194
2	206	210	210	201	197	206
3	210	211	210	200	205	207
4	210	...	...	198	...	...
5	210	...	...	190	...	...
6	210	...	...	201	...	...
7	209	...	198	195	...	178
8	209	210	204	196	168	169
9	211	192	...	200	161	...
10	210	186	...	198	138	...
11	206	192	...	195	137	...
12	209	...	...	194	...	...
13	210	...	...	195	...	...
14	...	...	205	...	...	198
15	...	...	210	...	...	198
16	210	213	206	199	174	183
17	208	222	197	195	168	178
18	205	217	206	200	180	183
19	206	...	206	199	...	192
20	209	...	197	199	...	173
21	209	...	192	199	...	168
22	209	...	206	200	...	178
23	210	...	201	200	...	160
24	210	...	...	181	...	...
25	206	...	...	190	...	...
26	202	...	...	169	...	...
27	205	...	...	184	...	...
28	203	196	194	174	170	174
29	205	...	196	195	...	185
30	206	...	...	199	...	...
Mean	207.8	205.3	202.8	194.5	198.3	193.8

TABLE B-1. (Contd.)

December						
Date	High			Low		
	1981	1982	1983	1981	1982	1983
1	209	...	...	198	...	...
2	210	...	...	200	...	...
3	209	...	193	199	...	186
4	209	...	205	197	...	168
5	209	...	207	200	...	183
6	206	...	209	200	...	199
7	209	...	203	200	...	189
8	210	...	198	199	...	172
9	210	...	...	199	...	...
10	210	...	...	199	...	...
11	210	...	...	200	...	...
12	210	...	210	199	...	193
13	201	...	192	200	...	188
14	210	...	...	200	...	...
15	210	...	...	200	...	...
16	209	...	210	199	...	188
17	209	...	206	200	...	180
18	207	...	205	200	...	173
19	210	...	208	200	...	163
20	203	...	...	180	...	...
21	201	210	...	180	193	...
22	205	204	...	190	172	...
23	206	205	...	194	168	...
24	205	193	...	200	173	...
25	209	209	...	199	172	...
26	208	209	...	189	203	...
27	210	211	...	180	199	...
28	206	209	205	199	192	198
29	...	208	210	...	185	180
30	...	206	...	...	174	...
31	...	199	...	...	184	...
Mean	207.9	205.7	204.4	196.4	183.2	182.9

TABLE B-2. Steam Temperature Versus Ambient
Temperature at Schober's Resort, Daily Highs, °F.

January						
Date	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	77	169	69	125	...	...
2	73	166	68	125	...	...
3	75	165	85	125	64	132
4	77	164	86	126	73	133
5	73	160	81	125	72	134
6	71	160	80	125	69	134
7	70	166	66	127	77	134
8	70	167	56	130	75	135
9	72	160	66	128	75	136
10	75	160	75	127	...	...
11	63	155	76	125	...	...
12	65	170	83	126	...	...
13	70	158	84	127	...	...
14	70	160	87	126	...	...
15	64	151	89	126	...	...
16	66	155	82	126	...	...
17	70	154	94	126	...	131
18	70	151	73	126	...	130
19	73	150	54	125	...	130
20	75	156	42	125	...	131
21	75	155	49	125	...	...
22	70	153	51	126	...	...
23	69	150	56	126	...	...
24	70	150	70	127	...	...
25	65	148	73	126	...	...
26	58	146	64	126	...	...
27	60	142	62	125	...	...
28	61	145	61	126	...	...
29	50	145	64	125	...	...
30	60	145	64	126	...	...
31	65	148	66	126	...	131

TABLE B-2. (Contd.)

February						
Date	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	70	144	62	125	58	131
2	65	144	60	125	49	130
3	70	140	61	125	49	130
4	70	144	50	125	65	130
5	65	140	51	126	...	...
6	73	140	50	126	...	...
7	60	139	54	125	64	132
8	67	139	55	125	63	133
9	70	139	75	126	63	133
10	75	137	80	125	67	132
11	75	143	45	125	68	133
12	73	140	55	125	65	135
13	79	143	59	125	64	132
14	83	140	60	125	68	127
15	86	140	73	125	68	134
16	82	135	75	126	74	134
17	80	137	79	126	75	136
18	85	135	81	129	79	134
19	87	138	81	126	86	135
20	72	135	81	126	95	134
21	75	135	81	130	...	...
22	75	139	80	129	79	133
23	75	133	81	126	75	132
24	69	132	64	125	81	132
25	61	133	77	126	63	131
26	61	133	75	125	75	131
27	65	126	72	125	63	129
28	47	125	75	129	62	130

TABLE B-2. (Contd.)

March						
Date	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	48	130	70	125	...	...
2	59	125	69	146	...	...
3	70	130	65	140	...	...
4	61	130	68	137	...	...
5	51	127	67	145	...	...
6	60	128	68	142	...	...
7	71	135	70	135	...	...
8	75	126	74	139	75	133
9	78	126	76	129	92	133
10	83	131	63	125	103	133
11	75	124	74	...	81	133
12	75	125	76	136	96	134
13	65	129	57	130	97	134
14	70	127	62	139	81	133
15	73	125	65	126	...	129
16	79	125	50	125	...	...
17	75	123	41	123	...	...
18	75	124	52	125	...	...
19	58	124	56	128	...	...
20	65	122	64	126	...	...
21	70	121	64	127	67	129
22	82	123	66	128	60	129
23	76	122	70	126	62	128
24	80	124	73	126	62	130
25	80	122	65	126	68	130
26	65	120	74	130	...	...
27	69	118	70	130	...	...
28	78	123	62	125	...	...
29	80	119	55	130	...	...
30	74	120	56	125	...	...
31	73	120	63	126	...	...

TABLE B-2. (Contd.)

April						
Date	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	73	120	61	126	...	...
2	65	119	75	131	...	...
3	74	121	80	129	...	...
4	80	121	71	126	63	128
5	84	123	75	133	59	128
6	85	120	69	145	67	132
7	85	124	68	134	69	131
8	82	121	70	136	72	132
9	85	120	72	131	78	132
10	85	120	74	131	65	131
11	87	121	70	127	...	...
12	80	119	70	135	...	...
13	87	121	79	126	...	...
14	93	124	80	125	...	...
15	92	120	79	126	...	...
16	91	124	79	127	...	...
17	90	120	80	131	...	...
18	81	119	81	126	...	...
19	68	118	85	126	...	...
20	76	119	84	125	...	...
21	90	121	74	129	...	...
22	95	121	79	130	...	...
23	98	124	85	127	...	...
24	98	122	87	129	...	...
25	95	121	89	121	71	134
26	84	120	89	121	76	134
27	85	120	83	127	73	134
28	95	120	95	126	74	132
29	103	123	93	128	76	134
30	105	120	94	126	72	133

TABLE B-2. (Contd.)

Date	May					
	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	106	121	91	127	...	...
2	101	121	90	126	79	133
3	94	120	87	126	76	134
4	83	116	80	125	74	133
5	90	122	...	...	77	131
6	86	122	...	...	...	...
7	88	124	...	...	...	...
8	93	123	...	...	...	...
9	93	124	...	...	87	132
10	109	123	71	124	78	135
11	99	120	73	125	77	132
12	100	121	86	126	77	136
13	96	121	89	126	78	134
14	95	123	85	117	87	136
15	89	121	93	126	90	134
16	85	120	94	126	88	132
17	88	122	90	125	88	134
18	88	136	90	118	89	135
19	78	129	92	124	90	136
20	82	129	95	120	92	136
21	88	126	98	126	98	137
22	90	123	101	123	102	137
23	99	121	102	130	...	...
24	100	125	100	131	...	...
25	92	121	104	125	...	...
26	90	127	100	128	...	...
27	77	120	101	127	...	...
28	100	123	89	127	...	...
29	105	126	90	126	...	...
30	104	124	94	129	...	...
31	100	122	97	131	...	...

TABLE B-2. (Contd.)

June						
Date	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	103	122	88	126	...	...
2	102	122	92	126	...	...
3	102	123	96	128	...	...
4	110	123	94	129	...	...
5	115	124	...	127	...	...
6	115	123	...	125	...	...
7	112	123	...	129	...	...
8	119	123	86	127	...	...
9	116	123	...	127	...	...
10	115	123	...	127	...	...
11	110	124	...	129	...	...
12	103	123	...	128	...	...
13	98	123	...	128	96	131
14	89	124	100	126	98	132
15	105	123	101	128	92	131
16	113	123	106	128	103	131
17	113	123	101	129	105	131
18	113	123	98	128	106	132
19	115	123	99	127	98	131
20	115	124	99	127	96	131
21	120	123	100	128	93	132
22	121	123	100	127	93	132
23	118	124	101	126	94	132
24	115	123	100	129	94	131
25	116	123	101	123	96	132
26	115	124	106	127	...	...
27	113	123	106	129	96	132
28	113	123	93	128	96	132
29	113	125	99	126	97	132
30	114	125	86	126	94	131

TABLE B-2. (Contd.)

July						
Date	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	107	126	94	127	98	134
2	108	126	99	129	...	...
3	103	125	100	127	...	...
4	106	125	94	124	...	...
5	111	126	95	124	103	134
6	115	125	93	125	102	132
7	120	123	98	126	100	131
8	119	125	100	122	...	...
9	114	125	101	124	...	...
10	115	125	104	119	...	...
11	104	125	105	121	100	134
12	112	126	101	120	106	135
13	104	126	108	118	106	132
14	104	121	108	118	104	131
15	108	121	107	127	104	131
16	106	120	107	119	97	133
17	115	120	106	127	...	...
18	107	120	102	121	...	...
19	105	120	95	129	...	...
20	106	121	107	121	96	131
21	108	122	109	120	99	132
22	109	122	109	129	99	133
23	105	120	107	129	99	132
24	106	120	104	131	98	131
25	114	120	104	120	101	136
26	115	120	...	...	95	132
27	118	120	...	...	96	134
28	111	123	...	...	98	136
29	111	121	...	...	104	136
30	111	120	...	...	105	136
31	105	120	...	...	105	138

TABLE B-2. (Contd.)

August						
Date	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	110	120	120	127	104	132
2	108	120	96	116	104	134
3	111	120	101	122	104	132
4	117	120	100	126	104	132
5	115	122	102	127	105	134
6	114	121	106	121	107	133
7	113	120	101	131	103	133
8	114	121	99	129	98	134
9	112	121	119	126	90	131
10	115	121	...	127	96	131
11	110	121	...	126	97	131
12	110	120	...	129	100	131
13	109	120	...	128	115	132
14	97	120	...	128	...	...
15	110	120	...	130	...	...
16	110	120	...	126	89	131
17	112	122	106	134	91	135
18	110	122	100	130	77	131
19	113	121	103	130	82	133
20	115	121	107	129	82	133
21	115	120	109	125	86	132
22	115	120	110	125	86	131
23	115	121	100	131	87	132
24	113	120	95	130	89	131
25	111	123	93	130	90	132
26	107	121	...	...	93	131
27	111	123	...	...	96	130
28	112	121	...	...	99	132
29	110	121	...	...	99	132
30	105	121	109	130	...	...
31	105	124	106	130	...	...

TABLE B-2. (Contd.)

September						
Date	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	107	123	102	134	108	134
2	104	123	106	135	111	131
3	104	123	106	136	107	127
4	104	123	...	...	105	126
5	104	123	...	...	106	131
6	104	123	105	134	109	131
7	110	125	99	131	106	130
8	110	123	97	132	91	126
9	103	124	99	133	88	129
10	106	124	100	134	99	129
11	109	125	102	134	91	130
12	109	124	100	136	92	123
13	106	124	...	132	101	131
14	109	123	...	133	86	126
15	104	124	...	134	81	123
16	109	124	...	133	75	122
17	110	125	...	133	80	126
18	110	125	...	132	75	130
19	110	124	...	...	89	130
20	110	124	...	...	85	131
21	102	121	...	...	96	129
22	100	121	...	...	100	130
23	99	123	...	...	100	130
24	99	123	...	...	85	129
25	99	123	...	...	81	127
26	100	124	...	...	86	129
27	101	123	...	...	92	131
28	100	123	...	129	75	127
29	91	122	72	129	74	127
30	95	120	63	128	76	129

TABLE B-2. (Contd.)

October						
Date	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	80	121	79	131	62	128
2	86	120	84	130	86	128
3	85	120	89	130	87	133
4	80	119	91	130	90	132
5	86	120	84	131	82	130
6	94	120	86	129	81	131
7	91	124	86	129	85	130
8	85	120	84	132	...	...
9	86	120	84	133	...	...
10	89	124	86	135	...	...
11	79	123	87	133	...	...
12	74	120	84	130	...	...
13	73	120	85	130	...	...
14	75	118	84	130	...	...
15	76	120	84	132	...	...
16	81	119	87	131	...	...
17	90	120	88	130	...	...
18	94	119	82	126	...	...
19	93	128	80	131	89	134
20	96	126	81	129	89	133
21	95	126	80	129	87	132
22	98	128	79	131	...	...
23	105	126	81	128	...	...
24	95	126	86	129	...	...
25	86	126	79	131	74	130
26	89	125	84	130	90	133
27	86	122	80	127	89	131
28	87	122	71	129	76	132
29	87	122	69	135	79	132
30	86	123	74	136	74	131
31	87	122	67	134	...	...

TABLE B-2. (Contd.)

November						
Date	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	76	132
2	83	...	74	138
3	91	126	72	135
4	90	127	74	135
5	84	124
6	79	125
7	85	127	50	130
8	90	127	44	131
9	85	126	47	130
10	85	126	48	129
11	81	128	51	131
12	88	124	48	129
13	76	126	Equipment down	
14	87	128	...	...
15	86	129	...	...
16	84	126	64	132		
17	84	134	65	133		
18	69	118	65	134		
19	67	115	65	135		
20	69	118	66	135		
21	69	115	...	...
22	69	113	50	134		
23	75	113	57	133		
24	76	113	68	135		
25	60	115	69	134		
26	59	119	64	134		
27	50	125	64	134		
28	45	124	...	...
29	55	124	...	...
30	58	125	...	...

TABLE B-2. (Contd.)

December						
Date	1981		1982		1983	
	Ambient	Steam	Ambient	Steam	Ambient	Steam
1	61	123	56	130	Equipment down	down
2	65	123	54	132		
3	75	123	65	134		
4	70	124	66	135		
5	70	124	65	130		
6	66	124	...	...
7	69	124	...	...
8	74	125	...	...
9	75	125	...	...
10	67	125	...	...
11	66	125	...	...
12	65	125	...	...
13	65	126	64	131		
14	70	125	73	130		
15	70	124	58	126		
16	69	125	84	126		
17	65	125	76	127		
18	60	125	79	127		
19	70	125	75	127		
20	79	125	75	131		
21	64	125	79	131		
22	56	125	57	129		
23	59	126	67	129		
24	57	125	65	130		
25	51	125	...	...
26	61	123	...	...
27	69	126	...	...
28	58	123	...	...
29	66	124	...	...
30	67	125	...	...
31	66	124	...	...

TABLE B-3. Coso Mud Pot Temperatures Versus Ambient Temperatures, Daily Highs, °F.

January						
Date	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1
2
3	69	...
4	75	...
5	74	...
6	70	...
7	89	...
8	76	...
9	84	...
10	84	...
11	72	149	89	...
12	65	146	84	...
13	65	162	86	...
14	70	164	87	...
15	73	157	83	...
16	74	162	82	...
17	70	160	75	156
18	72	160	75	157
19	55	153	67	149
20	41	152	67	150
21	53	150	65	152
22	55	145	59	156
23	60	145	70	156
24	65	155	71	168
25	71	169
26	80	146	69	167
27	64	155	60	157
28	60	148	67	161
29	74	143	64	169
30	78	160	65	168
31	68	157

TABLE B-3. (Contd.)

February						
Date	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1	63	144	75	164
2	60	150	59	152
3	63	150	56	150
4	51	145	60	150
5	51	145	60	156
6	51	145	61	160
7	55	154	75	167
8	60	144	71	157
9	58	148	72	165
10	46	158	79	160
11	56	145	81	166
12	60	143	76	170
13	64	149	75	163
14	74	146	79	169
15	75	145	77	164
16	83	148	83	171
17	78	145	79	170
18	75	135	74	163
19	75	138	77	161
20	83	142	78	167
21	86	141	80	169
22	80	138	85	173
23	82	140	76	168
24	79	134	71	159
25	72	140	63	159
26	78	140	72	164
27	74	148	67	162
28	75	143	66	168

TABLE B-3. (Contd.)

March						
Date	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1	...	176	66	150	...	151
2	65	176	71	160	60	162
3	74	176	65	164	68	168
4	61	176	65	165	...	...
5	52	176	65	145	...	...
6	73	176	68	160	...	...
7	69	176	67	158	...	...
8	79	176	74	159	...	...
9	100	176	75	155	...	...
10	96	182	80	137	...	...
11	85	180	65	154	...	...
12	75	178	75	168	...	...
13	66	173	77	166	...	...
14	78	176	57	158	...	...
15	83	180	...	152	...	...
16	90	180	49	157	...	...
17	83	180	43	160	...	...
18	81	178	55	149	...	...
19	59	176	58	140	...	...
20	66	171	57	145	...	...
21	79	175	63	145	...	...
22	86	176	65	154	...	...
23	82	175	...	155	...	...
24	88	176	...	155	...	...
25	85	176	...	148	...	...
26	65	176	...	155	...	...
27	65	176	...	154	...	...
28	86	176	...	146	...	...
29	90	176	...	149	...	...
30	81	175	...	156	...	...
31	82	175	...	151	...	...

AD-A147 894

COSO MONITORING PROGRAM JANUARY 1981 THROUGH DECEMBER
1983(U) NAVAL WEAPONS CENTER CHINA LAKE CA
S C BJORNSTAD ET AL. SEP 84 NWC-TP-6558

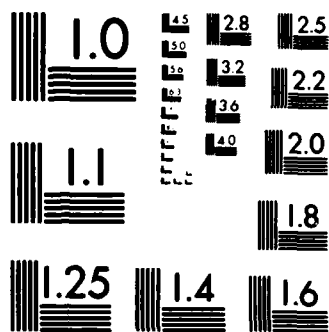
3/3

UNCLASSIFIED

F/G 8/8

NL

END



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TABLE B-3. (Contd.)

April						
Date	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1	77	174	...	149	...	...
2	66	170	...	151	...	...
3	81	175	...	155	...	...
4	85	176	...	146	...	...
5	91	181	...	160	...	...
6	94	175	76	155	...	...
7	91	175	62	156	...	...
8	89	176	70	156	...	...
9	95	180	70	146	...	...
10	90	179	70	140	...	...
11	89	180	70	151	...	...
12	90	176	79	152	...	...
13	95	175	79	160	...	...
14	98	180	79	166	...	...
15	100	125	75	144	...	...
16	98	160	76	133	...	...
17	100	161	83	136	...	...
18	76	163	85	143	...	...
19	80	156	85	144	...	...
20	86	166	70	137	...	...
21	80	168	75	93	...	...
22	95	165	83	105	...	...
23	100	166	88	120	...	...
24	85	150	85	115	...	...
25	75	140	90	118	...	...
26	85	108	80	123	...	...
27	87	100	87	125	...	...
28	97	...	90	125	...	...
29	106	...	97	125	...	...
30	110	...	97	132	...	...

TABLE B-3. (Contd.)

May						
Date	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1	...	171	96	131	...	...
2	...	171	95	132	...	...
3	95	171	92	128	...	...
4	99	171	84	125	...	...
5	98	117	92	122	...	...
6	95	108	100	131	...	...
7	100	109	98	124	...	...
8	100	109	93	124	...	...
9	95	110	75	110	...	...
10	100	111	73	113	...	...
11	100	111	71	110	...	...
12	107	119	87	140	...	...
13	101	110	90	139	...	...
14	100	115	84	130	...	...
15	96	109	95	135	...	...
16	91	109	98	134	...	...
17	91	107	98	130	...	167
18	90	110	92	123	...	164
19	79	99	94	125	...	162
20	85	117	98	123	...	160
21	92	125	101	125	...	...
22	98	117	105	135	...	...
23	107	117	105	125	...	...
24	106	117	106	130	...	...
25	95	110	105	126	...	...
26	99	115	104	120	...	...
27	83	144	104	120	...	...
28	104	161	95	117	...	...
29	109	138	91	112	...	...
30	110	130	98	121	...	...
31	107	125	98	118	...	131

TABLE B-3. (Contd.)

Date	June					
	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1	122	132	95	117	112	124
2	122	132	90	118	106	123
3	140	132	103	120	110	124
4	145	132	97	120	123	134
5	133	132	91	118	119	...
6	128	132	90	115	116	132
7	126	132	89	120	...	131
8	121	115	95	125	106	126
9	120	122	100	125	111	129
10	118	128	105	120	113	131
11	105	127	105	120	110	123
12	125	127	95	120	106	136
13	99	121	91	120	...	126
14	90	126	100	127	...	128
15	101	155	117	140	...	129
16	118	128	135	145	...	124
17	114	128	111	130	...	126
18	115	132	102	134	...	126
19	121	131	100	132	...	123
20	125	136	105	132	...	124
21	112	135	102	129	...	126
22	137	156	105	125	...	125
23	121	140	105	131	...	131
24	124	122	105	125	...	130
25	121	129	105	130	...	...
26	120	131	105	128	...	...
27	121	132	110	130	...	...
28	117	136	115	124	111	129
29	115	142	95	130	105	126
30	114	140	...	...	110	133

TABLE B-3. (Contd.)

July						
Date	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1	124	149	99	132	101	121
2	...	...	99	126	102	122
3	...	...	106	133	110	129
4	...	...	105	137	109	123
5	...	...	110	136	119	127
6	110	143	99	132	111	129
7	115	150	99	126	118	120
8	115	...	102	133	109	120
9	112	...	105	145	107	139
10	112	...	105	140	...	...
11	114	...	107	140	119	139
12	115	...	111	146	118	...
13	118	149	110	148	...	132
14	125	...	114	150	129	131
15	120	...	123	148	130	...
16	120	...	122	141	121	...
17	118	...	112	143	118	122
18	120	...	114	142	...	...
19	119	...	111	144	...	...
20	135	189	111	144	119	...
21	123	180	114	151	122	131
22	120	183	114	145	123	129
23	121	189	117	149	122	...
24	117	177	109	143	122	...
25	118	175	110	149	...	...
26	115	167	110	142	119	130
27	118	175	105	149	121	...
28	124	171	113	169	121	...
29	122	175	117	162	126	127
30	119	165	122	166	126	131
31	114	176	122	158	134	131

TABLE B-3. (Contd.)

August						
Date	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1	116	175	119	154	116	130
2	120	175	99	151	122	131
3	118	170	104	162	123	130
4	119	175	106	161	121	131
5	125	181	111	164	131	140
6	126	160	109	169	130	139
7	100	160	106	183	126	139
8	120	177	114	169	109	139
9	120	160	111	175	101	131
10	120	179	114	203	119	143
11	116	164	114	210	122	141
12	115	162	106	199	127	140
13	105	125	108	201	131	141
14	107	140	109	204	128	141
15	115	150	112	196	...	...
16	120	145	121	190	110	143
17	123	142	104	194	119	159
18	120	140	108	197	109	170
19	110	145	113	192	102	161
20	115	155	121	194	110	165
21	118	142	118	193	110	169
22	114	145	116	198	106	174
23	117	150	116	193	106	174
24	117	150	101	194	105	173
25	123	149	93	198	104	158
26	120	151	101	174	106	159
27	121	160	103	184	117	149
28	120	145	99	179	124	130
29	120	150	106	169	122	133
30	119	145	129	156	119	134
31	115	145	109	164	120	131

TABLE B-3. (Contd.)

September						
Date	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1	111	171	111	170	119	133
2	111	172	111	174	120	132
3	111	185	112	174	129	139
4	111	165	107	167	129	133
5	114	165	107	167	...	...
6	111	172	106	171	123	131
7	99	141	109	166	117	129
8	107	145	102	171	117	127
9	110	171	...	...	124	129
10	113	168	...	...	125	134
11	117	167	...	...	129	132
12	116	163	...	...	116	131
13	116	166	...	...	124	132
14	118	170	...	...	125	132
15	110	164	...	...	124	129
16	115	171	...	...	125	131
17	115	168	...	...	126	132
18	115	171	...	...	125	131
19	115	172	...	...	...	...
20	115	171	...	...	...	...
21	113	168	...	...	...	...
22	113	165	...	...	...	...
23	106	166	...	...	...	...
24	107	166	...	...	...	...
25	109	163	...	...	...	...
26	109	167	...	...	101	175
27	109	165	...	174	101	178
28	105	167	...	179	86	163
29	105	156	...	174	73	175
30	100	132	...	166	89	169

TABLE B-3. (Contd.)

October						
Date	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1	82	150	...	167	95	166
2	98	164	...	176	103	165
3	96	163	...	171	109	165
4	94	162	...	174	108	161
5	96	159	...	174	101	160
6	100	148	...	165	110	163
7	95	142	...	168	79	163
8	95	155	...	171	105	162
9	98	156	...	172	100	162
10	90	150	...	161	110	164
11	87	156	...	162	100	165
12	81	165	...	166	100	162
13	80	162	...	167	93	163
14	75	162	...	...	94	168
15	79	162	...	...	89	160
16	92	165	...	...	...	...
17	94	166	...	...	...	...
18	95	151	...	...	99	199
19	103	145	...	...	101	200
20	106	150	...	...	...	...
21	104	149	...	...	...	...
22	95	146	...	...	...	...
23	105	145	...	...	...	...
24	105	151	...	...	...	...
25	102	157	...	...	...	...
26	102	163	...	...	99	200
27	98	159	...	...	103	205
28	98	160	...	...	93	200
29	84	162	...	...	98	200
30	83	168	...	...	89	200
31	93	163	...	...	89	203

TABLE B-3. (Contd.)

November						
Date	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1	98	164	...	...	89	200
2	100	162	...	...	76	199
3	100	159	...	...	90	200
4	95	164	...	...	99	202
5	95	163	...	...	96	204
6	92	166	...	...	98	200
7	95	162	...	...	95	202
8	95	152	...	...	75	195
9	95	150	...	...	74	199
10	90	151	...	...	78	198
11	92	152	...	...	76	196
12	95	163	...	...	85	200
13	84	162	...	...	67	190
14	101	162	...	...	76	195
15	100	164	...	...	80	201
16	103	165	...	155	81	200
17	90	162	...	161	86	198
18	74	159	...	159	80	195
19	70	164	...	174	68	198
20	68	164	...	171	...	...
21	71	168	...	169	60	187
22	70	165	...	166	60	191
23	78	170	...	164	62	193
24	75	170	...	170	61	187
25	63	160	...	170	47	185
26	59	163	...	171	...	...
27	54	161	...	166	...	...
28	46	159	...	167	76	198
29	58	150	73	162	79	199
30	60	150	58	166	...	...

TABLE B-3. (Contd.)

December						
Date	1981		1982		1983	
	Ambient	Mud	Ambient	Mud	Ambient	Mud
1	63	150	57	165	...	...
2	68	150	59	164	...	...
3	73	155	69	171	...	...
4	75	159	72	169	...	...
5	74	151	74	171	59	192
6	72	159	72	167	...	...
7	70	145	56	156	...	...
8	77	147	64	151	...	...
9	74	149	69	159	...	...
10	70	148	66	160	...	...
11	70	157	70	164	...	...
12	67	161	69	160	80	196
13	70	154	66	151	79	199
14	74	145	64	159	...	...
15	70	150	62	154	...	...
16	70	154	61	154	94	200
17	67	140	73	156	62	194
18	63	137	72	157	84	200
19	70	146	69	157	99	200
20	80	136	71	154	...	...
21	66	137	69	149	...	...
22	59	147	61	150	...	...
23	60	156	54	153	...	...
24	60	159	49	131	...	...
25	65	162	...	156	...	...
26	63	163	...	160	...	...
27	72	165	...	...	...	...
28	69	165	...	...	74	190
29	68	164	...	...	87	199
30	69	165	...	...	85	204
31	67	163	...	...	101	205

NWC TP 6558

Appendix C
TEMPERATURE LOG DATA

TABLE C-1. Temperature Log Data for 12-21-81, °F.

Coso Well 1		Coso Well 1		Well 4P-1		Well 4K-1	
Ambient temperature, 58.5		Ambient temperature, 58.5		Ambient temperature, 63		Ambient temperature, 61	
Depth, ft	Temperature	Depth, ft	Temperature	Depth, ft	Temperature	Depth, ft	Temperature
0	...	190	222.5	0	...	0	200.5
10	201	200	223	10	200.5	10	200.5
20	201.5	210	223	20	200.5	20	200.5
30	201.5	220	223.5	30	200.5	30	200.5
40	201.5	230	224	40	200.5	40	200.5
50	201.5	240	225.5	50	200.5	50	200.5
60	201.5	250	227	60	200.5	60	204
70	201.5	260	230	70	203	70	207.5
80	201.5	270	231	80	203.5	80	207.5
90	201.5	280	232	90	208	90	208
100	201.5	290	233	95	208	100	207.5
110	201.5	300	234	100	220	110	207.5
120	201.5	310	234.5	105	220	120	207.5
130	201.5	320	236			130	207.5
140	205	330	237.5				
150	217.5	340	237.5				
160	219.5	350	237.5				
170	220						
180	222						

TABLE C-2. Temperature Log
Data for 6-16-82.

Coso Well 1

Ambient temperature, 91.5°F

Depth, ft.	Temperature, °F
0	199
25	210
50	210
75	210
100	210
125	210
150	224
175	231
200	233
225	233
250	236
275	240
300	243
325	244
350	248

TABLE C-3. Temperature Log Data for 4-12-83.

Coso Well 1			Well 4P-1			Well 4K-1		
Ambient temperature, 9.4°C (48.9°F)			Ambient temperature, 11.1°C (52°F)			Ambient temperature, 11.1°C (52°F)		
Depth, ft	Temperature		Depth, ft	Temperature		Depth, ft	Temperature	
	°C	°F		°C	°F		°C	°F
0	96.66	206.0	0	96.97	206.5	0	94.20	201.6
25	97.51	207.5	10	97.14	206.9	10	97.10	206.8
50	97.58	207.6	20	97.13	206.8	20	97.15	206.9
75	97.55	207.6	30	97.13	206.8	30	97.16	206.9
100	97.52	207.5	40	97.14	206.9	40	97.19	206.9
125	97.49	207.5	50	97.12	206.8	45	97.21	207.0
135	97.49	207.5	60	97.11	206.8	50	97.18	206.9
140.8	98.76	209.8	65	97.10	206.8	55	97.15	206.9
145	102.65	216.8	68	97.88	208.2	60	97.61	207.7
150	106.11	223.0	70	98.96	210.1	65	100.81	213.5
175	110.05	230.1	80	99.85	211.7	70	101.47	214.6
200	111.20	232.2	90	100.89	213.6	75	102.14	215.9
225	111.35	232.4	100	105.31	221.5	80	102.74	216.9
250	113.02	235.4	104	109.27	228.7	85	102.90	217.2
275	116.78	242.2	...	...	...	86	102.92	217.3
300	118.56	245.4	...	...	...	...	...	...
325	119.92	247.9	...	...	...	...	...	...
350	121.42	250.6	...	...	...	...	...	...
353	121.46	250.6	...	...	...	...	...	...

TABLE C-4. Temperature Log, Coso Well 1, 12-14-83.

Air temperature, 19.4°C (66.9°F).

Depth, ft	Instrument reading, °C	Corrected temperature	
		°C	°F
0	86.4	87.8	190.0
25	95.6	97.1	206.8
50	95.7	97.2	207.0
75	95.7	97.2	207.0
100	95.7	97.2	207.0
125	95.7	97.2	207.0
135	95.7	97.2	207.0
137	95.7	97.2	207.0
138	95.7	97.2	207.0
139	96.0	97.5	207.5
140	96.6	98.2	208.8
140.5	97.3	98.9	210.0
141	97.4	99.0	210.2
142	98.5	100.1	212.2
143	99.1	100.7	213.3
145	100.6	102.2	216.0
150	103.9	105.6	222.1
175	106.7	108.4	227.1
200	108.1	109.8	229.6
225	108.4	110.1	230.2
250	110.0	111.8	233.2
275	113.2	115.0	239.0
300	114.9	116.7	242.1
325	116.5	118.4	245.1
345	117.6	119.5	247.1
350	117.6	119.5	247.1

TABLE C-5. Temperature Log, Well 4K-1, 12-14-83.

Air temperature, 18.8°C (65.8°F).

Depth, ft	Instrument reading, °C	Corrected temperature	
		°C	°F
0	95.4	96.9	206.4
10	95.4	96.9	206.4
20	95.4	96.9	206.4
30	95.4	96.9	206.4
40	95.4	96.9	206.4
50	95.4	96.9	206.4
56	95.4	96.9	206.4
57	95.8	97.3	207.1
58	96.4	98.0	208.4
59	97.1	98.7	209.7
60	97.9	99.5	211.1
70	99.3	100.9	213.6
80	101.3	102.9	217.2
90	102.2	103.8	218.8
95	101.9	103.5	218.3

TABLE C-6. Temperature Log, Well 4P-1, 12-14-83.

Air temperature, 19°C (66.2°F).

Depth, ft	Instrument reading, °C	Corrected temperature	
		°C	°F
0	95.2	96.7	206.1
10	95.2	96.7	206.1
20	95.2	96.7	206.1
30	95.2	96.7	206.1
40	95.2	96.7	206.1
50	95.2	96.7	206.1
60	95.2	96.7	206.1
61	95.2	96.7	206.1
62	95.2	96.7	206.1
63	95.2	96.7	206.1
64	95.4	96.9	206.4
65	96.3	97.8	208.0
66	96.7	98.3	208.9
67	97.0	98.6	209.5
68	97.2	98.8	209.8
69	97.2	98.8	209.8
70	97.3	98.9	210.0
80	97.6	99.2	210.6
90	99.3	100.9	213.6
100	104.9	106.6	223.9
104	105.4	107.1	224.8

INITIAL DISTRIBUTION

- 4 Naval Air Systems Command
 - AIR-01A (1)
 - AIR-4106B (1)
 - AIR-7226 (2)
- 2 Chief of Naval Operations
 - OP-413F (1)
 - OP-45 (1)
- 2 Chief of Naval Material
 - MAT-08E, Cdr. Clark (1)
 - MAT-05 (1)
- 7 Naval Facilities Engineering Command, Alexandria
 - FAC-03 (1)
 - FAC-032E (1)
 - FAC-04 (1)
 - FAC-08T (1)
 - FAC-09B (1)
 - FAC-111 (1)
 - FAC-1113 (1)
- 1 Naval Facilities Engineering Command, Atlantic Division, Norfolk (Utilities Division)
- 1 Naval Facilities Engineering Command, Chesapeake Division, (Maintenance and Utilities Division)
- 1 Naval Facilities Engineering Command, Northern Division, Philadelphia (Utilities Division)
- 1 Naval Facilities Engineering Command, Pacific Division, Pearl Harbor (Utilities Division)
- 1 Naval Facilities Engineering Command, Southern Division, Charleston (Utilities Division)
- 6 Naval Facilities Engineering Command, Western Division, San Bruno
 - Code 09B (1)
 - Code 09C3 (1)
 - Code 11 (1)
 - Code 1135 (1)
 - Code 1135E, D. Kreske (1)
 - Code 24 (1)
- 4 Naval Sea Systems Command
 - SEA-04H3 (1)
 - SEA-05R13 (1)
 - SEA-09B312 (2)
- 1 Commander in Chief, U.S. Pacific Fleet (Code 325)
- 1 Headquarters, U.S. Marine Corps
- 1 Commander, Third Fleet, Pearl Harbor
- 1 Commander, Seventh Fleet, San Francisco
- 3 Naval Academy, Annapolis
 - Director of Research (2)
 - Library (1)
- 3 Naval Civil Engineering Laboratory, Port Hueneme
 - Commanding Officer (1)
 - LO3AE, Dave Holmes (1)
 - Technical Library (1)
- 2 Naval Energy & Environmental Support Activity, Port Hueneme
 - Code 11011 (1)
 - Code 111A (1)

- 1 Naval Postgraduate School, Monterey (Library)
- 3 Naval Ship Weapon Systems Engineering Station, Port Hueneme
 - Code 5711, Repository (2)
 - Code 5712 (1)
- 1 Naval War College, Newport
- 1 Headquarters, U.S. Army (DALO-TSE)
- 1 Chief of Engineers (DAEN-MPZ-E)
- 1 Construction Engineering Research Laboratory, Champaign (CERL-ES)
- 1 Facilities Engineer Support Agency, Ft. Belvoir (FESA-TE)
- 1 Headquarters, U.S. Air Force (AF/LEY)
- 1 Air Force Systems Command, Andrews Air Force Base (AFSC/DEE)
- 2 Air Force Academy, Colorado Springs
 - Code LGSF (1)
 - Library (1)
- 1 Air Force Intelligence Service, Bolling Air Force Base (AFIS/INTAW, Maj. R. Lecklider)
- 1 Air Force Wright Aeronautical Laboratories, Wright-Patterson Air Force Base (AFWAL/POOC)
- 1 Civil Engineering Center, Tyndall Air Force Base (DEB)
- 1 McClellan Air Force Base (SMAL/XRE)
- 12 Defense Technical Information Center
 - 1 Bureau of Mines, Reno, NV
 - 1 Department of Energy, San Francisco Operations, Oakland, CA (J. Crawford)
 - 1 General Services Administration, Public Buildings Service (Energy Conservation Division)
- 5 United States Geological Survey, Menlo Park, CA
 - Dr. Bacon (1)
 - Dr. Christianson (1)
 - Dr. Duffield (1)
 - R. Stone (1)
 - Library (1)
- 1 Advisory Council on Historic Preservation, Golden, CO
- 1 Associated Universities, Inc., Upton, NY (Brookhaven National Laboratory)
- 1 California Department of Conservation, Sacramento, CA
- 1 California Department of Water Resources, Sacramento, CA
- 1 California Division of Mines and Geology, Sacramento, CA
- 1 California State Land Division, Sacramento, CA
- 1 Geothermal Resources Council, Davis, CA
- 1 Lawrence Berkeley Laboratory, Berkeley, CA
- 1 Lone Pine Band of Owens Valley, Lone Pine, CA (Paiute-Shoshone Indians)
- 1 Los Alamos National Laboratory, Los Alamos, NM (Reports Library)
- 1 Native American Heritage Commission, Sacramento, CA
- 1 Oak Ridge National Laboratory, Oak Ridge, TN (Energy Division)
- 1 Office of Historic Preservation, Department of Parks and Recreation, Sacramento, CA (Marion Mitchell-Wilson, Deputy SHPO)
- 1 San Diego Gas & Electric Company, San Diego, CA (Otto Hirt)
- 1 The Johns Hopkins University, Applied Physics Laboratory, Laurel, MD
- 1 University of Hawaii, Honolulu, HI (Institute of Geophysics)
- 3 University of Utah, Salt Lake City, UT
 - Department of Geology, Dr. J. A. Whelan (1)
 - Earth Science Laboratory, H. P. Ross (1)
 - Geology & Geophysics Library (1)
- 1 University of Utah Research Institute, Salt Lake City, UT (Earth Sciences Group)

END

FILMED

12-84

DTIC